American Metal Ware Volume Banquet Brew Systems

Installation, Operation & Service Manual

For

Models AMV-60, AMV-80, AMV-120 & AMV-160

TABLE OF CONTENTS

General Description.....1
Utility Data.....2
Performance Chart.....5
Brew Urn Installation.....6
Holding Urn Installation.....8
Pre-Rinse Hose & Spray.....9
Start Up : Brew Urn.....10
Holding Urn.....11
How to Brew.....12
Solid State Coffee Agitation.....16
Care & Cleaning of Coffee Urn.....18
Cleaning Transfer System.....19
Space Saver Urn Service.....21
Operation Malfunction.....23
Dual Level Control.....25
Troubleshooting.....27
Pre-Rinse Valve Unit Repair.....30
Parts List.....34

[X] Electric [ ] Steam

Special Features

After completing installation and set-up, the equipment owner should keep this manual for future reference.

Grindmaster Corporation™
4003 Collins Lane
Louisville, Kentucky 40245 USA
(502) 425-4776
(800) 695-4500 (USA and Canada only)
(800) 568-5715 (technical service only)
FAX: (502) 425-4664
www.grindmaster.com

© Grindmaster Corporation™, 1996
PRINTED IN USA

0205 Form # AM-321-04

AMERICAN METAL WARE
HIGH VOLUME COFFEE BREWING/HOLDING SYSTEM

GENERAL DESCRIPTION

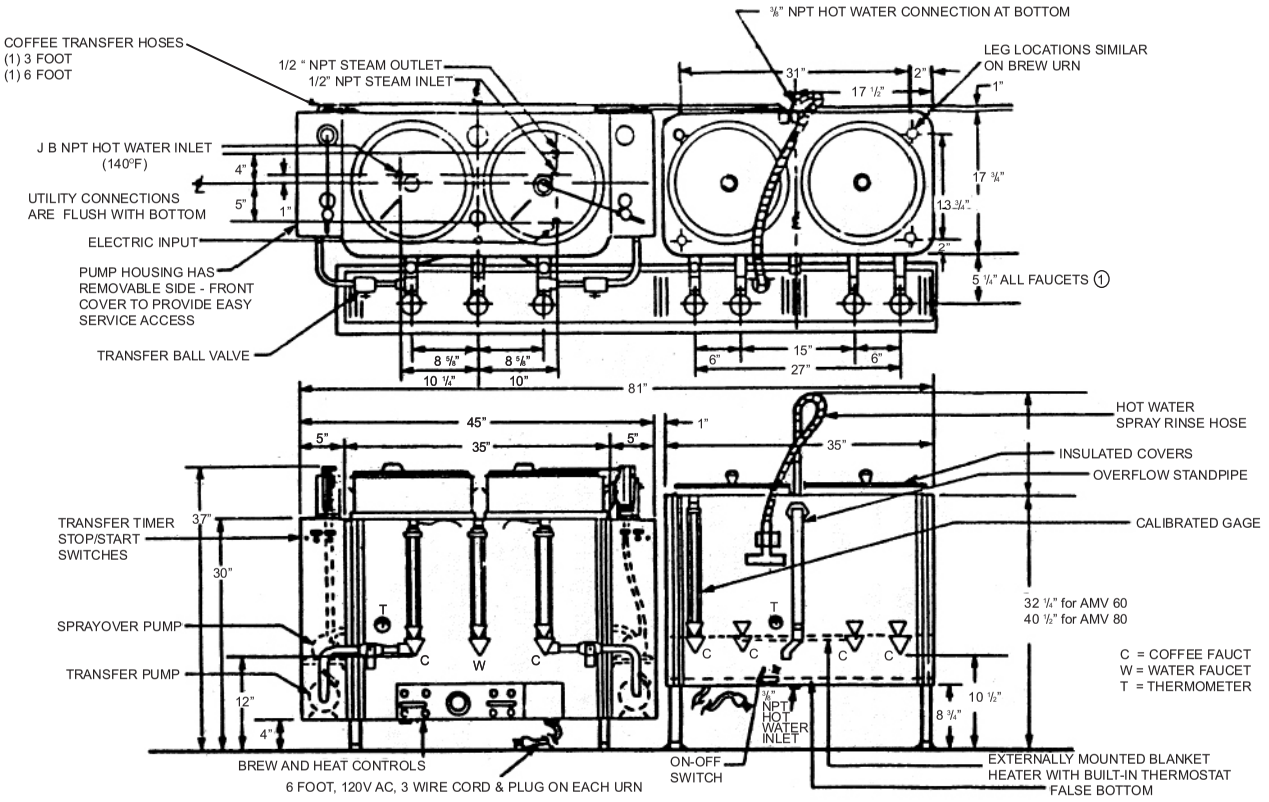
American Metal Ware's high volume coffee brewing/holding systems provide advantages to the user in the three functions of 1) brewing, 2) holding, 3) transfer/fill operation. Each coffee urn is equipped to brew both sides at one time; 20 gallons of coffee can be brewed within 15 minutes, 10 gallons on each side. The basic brewing urn is of the Space Saver type, electric or steam heat. It requires connection to a source of 140^0 F. potable hot water, 3/8" NPT. Each urn uses a pump-type brewing system, with a separate sprayover pump and spray arm for each coffee liner. Additional equipment and options included on each brewing urn:

- Two all stainless steel coffee liner filter screens.
- Two Model BB810 brew baskets for use with paper filters.
- Low water cutoff system to protect the urn and immersion heater.
- Automatic refill of the water compartment.
- Adjustable bypass on each spray arm.
- Start/Stop pushbutton brewing timers, one for each coffee liner.
- Automatic air agitation of the coffee, programmed to operate only when not using the transfer pump system.
- Two coffee transfer pumps with NSF approved stainless steel braid covered teflon lined hoses to connect the brewing urn liners to a holding urn. The transfer pumps are mounted in stainless steel housings located on the left and right ends of the coffee brewing urn.
- Easy access for service is provided from the front of the housings, which also contain the sprayover pumps.
- Sanitary teflon sealed ball valves connect the transfer system to the coffee brewing liners. When the valves are closed, the liners are isolated from the transfer system and holding urn.

Thus, the automatic coffee brewing urn may be used as a normal coffee urn and 10 gallons can be brewed as an individual batch at any time.

Also included in the high volume coffee brewing system is one special coffee holding urn. The gallon capacity is listed in the table that follows. Coffee is held at 180° F. to 190^0 F. by externally mounted electric heaters underneath the stainless steel bottom. Thermostatic control is provided. This holding unit has 4 coffee faucets, as shown on the layout drawing, with approximately 10" clearance under the faucet spouts. This arrangement of faucets allows a very rapid transfer/fill of 64 oz. coffee serving pots. One 64 oz. pot can be filled within 15 seconds from any one of the 4 faucets. One operator can operate (2) of the coffee drawoff faucets and fill (6) 64-oz. coffee pots per minute. Two operators can fill (12) 64-oz. coffee pots per minute. This enables very high volume use of the coffee with a minimum amount of labor cost.

UTILITY DATA AMV 60/80


COFFEE TRANSFER HOSES
(1) 3 FOOT
(1) 6 FOOT
1/2 " NPT STEAM OUTLET
1/2" NPT STEAM INLET
3/8" NPT HOT WATER CONNECTION AT BOTTOM
LEG LOCATIONS SIMILAR ON BREW URN
J B NPT HOT WATER INLET (140°F)
UTILITY CONNECTIONS ARE FLUSH WITH BOTTOM
ELECTRIC INPUT
PUMP HOUSING HAS REMOVABLE SIDE - FRONT COVER TO PROVIDE EASY SERVICE ACCESS
TRANSFER BALL VALVE
5 1/4" ALL FAUCETS (1)
HOT WATER SPRAY RINSE HOSE
INSULATED COVERS
OVERFLOW STANDPIPE
CALIBRATED GAGE
TRANSFER TIMER STOP/START SWITCHES
SPRAYOVER PUMP
TRANSFER PUMP
32 1/4" for AMV 60
40 1/2" for AMV 80
C = COFFEE FAUCT
W = WATER FAUCET
T = THERMOMETER
3/8" NPT HOT WATER INLET
BREW AND HEAT CONTROLS
ON-OFF SWITCH
EXTERNALLY MOUNTED BLANKET HEATER WITH BUILT-IN THERMOSTAT
FALSE BOTTOM
6 FOOT, 120V AC, 3 WIRE CORD & PLUG ON EACH URN

ALL AMV 60 AND 80 SYSTEMS ARE DUAL WALL INSULATED.

BREW URN: MODEL 91119 ELECTRIC OR STEAM HEAT.
WITH (2) 10 GAL. LINERS; (2) BBS19 BREW BASKETS FOR (25-11) PAPER FILTERS OR (17-9) MUSLIN BAG; (2) BOTTOM LINER FILTER SCREENS.

HOLDING URN: ELECTRIC HEAT ONLY.
40 GAL. MODEL 99040E FOR AMV 60, 450 LBS. WHEN FULL, OR 80 GAL. MODEL 99060E FOR AMV 80, 625 LBS. WHEN FULL.

1. BREW URN AND HOLDING URN REQUIRE CONNECTION TO HOT WATER (140°F) SUPPLY, 3/8" NPT.

2. SEPARATE 120V. SINGLE PHASE, 3 WIRE, 20 AMP OUTLET REQUIRED FOR BREW URN AND FOR HOLDING URN. USE NEMA RECEPTACLE NO 5-20R, 3 WIRE CORD AND PLUG SUPPLIED ON EACH URN

A) TOTAL PUMP/CONTROL LOAD FOR BREW URN = 15 AMP, FOR EACH SYSTEM = 30 AMP.
B) TOTAL HEATER LOAD FOR HOLDING URN = 3 KW/16.5 AMP

3. BREW URN - ELECTRIC HEAT

A) SPECIFY SERVICE: 208 VOLT - 1 PH. 2 WIRE
240 VOLT - 1 PH. 2 WIRE
208 VOLT - 3 PH. 3 WIRE
240 VOLT - 3 PH. 3 WIRE
480 VOLT - 3 PH. 3 WIRE

B) TOTAL HEATER LOAD FOR EACH BREW URN

KW Heater Size	15KW		
Elec. Supply Volts	208	240	480V
Amps Drawn 1 Ph.	72	63	--
Amps Drawn 3 Ph.	42	36	18

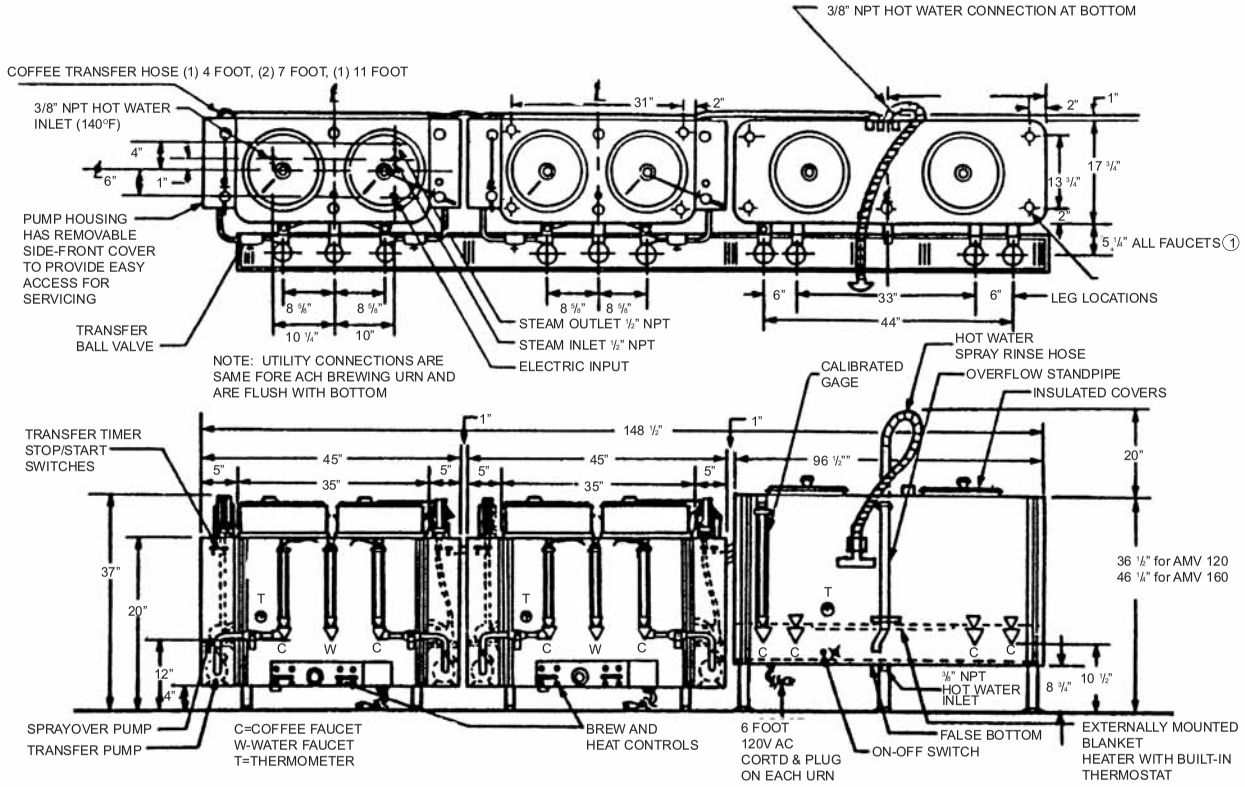
4. EACH BREW URN - STEAM HEAT

A) STANDARD OPERATING STEAM PRESURE = 10 - 25 PSI

B) MAXIMUM STEAM DEMAND LBS. PER HOUR TOTAL = 70

C) TOTAL BOILER HORSEPOWER = 2.3

REVISIONS			AMERICAN METAL WARE		
NO.	DATE	BY			
1	11-23-81 5 1/4 WAS 6	LRO	HIGH VOLUME/BANQUET COFFEE BREWING/HOLDING SYSTEM. MODELS AMV 60 AND AMV 80		
2					
3			DRAWN BY R.8 LRO	SCALE N.T.S.	MATERIAL
4			CHK'D LRO,GRM	DATE 8-5-81	DRAWING NO. B-290
5			TRACES	APPS .	


3/8" NPT HOT WATER CONNECTION AT BOTTOM
COFFEE TRANSFER HOSE (1) 4 FOOT, (2) 7 FOOT, (1) 11 FOOT
3/8" NPT HOT WATER INLET (140°F)
PUMP HOUSING HAS REMOVABLE SIDE-FRONT COVER TO PROVIDE EASY ACCESS FOR SERVICING
TRANSFER BALL VALVE
NOTE: UTILITY CONNECTIONS ARE SAME FORE ACH BREWING URN AND ARE FLUSH WITH BOTTOM
STEAM OUTLET ½" NPT
STEAM INLET ½" NPT
ELECTRIC INPUT
5 ¼" ALL FAUCETS ①
LEG LOCATIONS
HOT WATER SPRAY RINSE HOSE
OVERFLOW STANDPIPE
INSULATED COVERS
CALIBRATED GAGE
TRANSFER TIMER STOP/START SWITCHES
36 ½" for AMV 120
46 ¼" for AMV 160
¾" NPT HOT WATER INLET
SPRAYOVER PUMP
TRANSFER PUMP
C=COFFEE FAUCET
W-WATER FAUCET
T=THERMOMETER
BREW AND HEAT CONTROLS
6 FOOT 120V AC CORTD & PLUG ON EACH URN
ON-OFF SWITCH
FALSE BOTTOM
EXTERNALLY MOUNTED BLANKET HEATER WITH BUILT-IN THERMOSTAT

ALL AMV 120 AND 160 SYSTEMS ARE DUAL WALL INSULATED.

BREW URN: MODEL 91119 ELECTRIC OR STEAM HEAT.
WITH (2) 10 GAL. LINERS; (2) BBS19 BREW BASKETS
FOR (25-11) PAPER FILTERS OR (17-9) MUSLIN BAG;
(2) BOTTOM LINER FILTER SCREENS.

HOLDING URN: ELECTRIC HEAT ONLY.
80 GAL. MODEL 99040E FOR AMV 120, 850 LBS.
WHEN FULL, OR 120 GAL. MODEL 99060E FOR AMV 160,
1200 LBS. WHEN FULL.

UTILITY DATA AMV 120/160

1. BREW URN AND HOLDING URN REQUIRE CONNECTION TO HOT WATER (140°F) SUPPLY, 3/8" NPT.

2. SEPARATE 120V. SINGLE PHASE, 3 WIRE, 20 AMP OUTLET REQUIRED FOR BREW URN AND FOR HOLDING URN. USE NEMA RECEPTACLE NO 5-20R, 3 WIRE CORD AND PLUG SUPPLIED ON EACH URN

   A) TOTAL PUMP/CONTROL LOAD FOR BREW URN = 15 AMP
   B) TOTAL HEATER LOAD FOR HOLDING URN = 2 KW/16.5 AMP

3. BREW URN - ELECTRIC HEAT

   A) SPECIFY SERVICE: 208 VOLT - 1 PH. 2 WIRE
   240 VOLT - 1 PH. 2 WIRE
   208 VOLT - 3 PH. 3 WIRE
   240 VOLT - 3 PH. 3 WIRE
   480 VOLT - 3 PH. 3 WIRE

   B) TOTAL HEATER LOAD FOR EACH BREW URN

KW Heater Size	15KW		
Elec. Supply Volts	208	240	480V
Amps Drawn 1 Ph.	72	63	--
Amps Drawn 3 Ph.	42	36	18

   C) TOTAL HEATER LOAD FOR SYSTEM = 20KW

4. EACH BREW URN - STEAM HEAT

   A) STANDARD OPERATING STEAM PRESURE = 10 - 25 PSI GAUGE

   B) MAXIMUM STEAM DEMAND LBS. PER HOUR TOTAL = 70

   C) TOTAL BOILER HORSEPOWER = 2.3

   D) TOTAL STEAM DEMAND FOR SYSTEM = 140 LBS. PER HOUR REQUIRING 4.6 BOILER HORSEPOWER

REVISIONS			AMERICAN METAL WARE		
NO.	DATE	BY			
1	11-23-81 5 1/4 WAS 6	LRO	HIGH VOLUME/BANQUET COFFEE BREWING/HOLDING SYSTEM. MODELS AMV 60 AND AMV 80		
2					
3			DRAWN BY R.8 LRO	SCALE N.T.S.	MATERIAL
4			CHK'D LRO,GRM	DATE 8-5-81	DRAWING NO. B-290
5			TRACES	APPS .	

UTILITY DATA AMV 60/80, 120/160

1. Brew urn(s) and holding urn require connection to hot water (140^{0}F) supply, 3/8" NPT.

2. Separate 120V, single phase, 3 wire 20 amp outlet required for each brew urn and for holding urn. Use nema receptacle no. 5-20R. 3 wire cord and plug supplied on each urn.

    A) Total pump/control load
        1) for each brew urn = 15 amp
        2) for AMV 60/80 system = 15 amp
        3) for AMV 120/160 system = 30 amp

    B) Total heater load for holding urn = 2KW/16.5 amp

3. Each brew urn - Electric heat

    A) Specify service: 208Volt-1Ph. 2Wire
    240Volt-1Ph. 2Wire
    208Volt-3Ph. 3Wire
    240Volt-3Ph. 3Wire
    480Volt-3Ph. 3Wire

    B) Total heater load for each brew urn

KW Heater Size	150KW		
Elec. Supply Volts	208	240	480V
Amps Drawn 1 Ph.	72	63	-
Amps Drawn 3 Ph.	42	36	18

    C) Total heater load for AMV 60/80 system = 15KW
    D) Total heater load for AMV-120/160 system = 30KW

4. Each brew urn - Steam heat

    A) Standard operating steam pressure = 10-25 PSI gage
    B) Maximum steam demand-lbs. per hour total = 70
    C) Total boiler horsepower 2.3
    D) Total steam demand for AMV 60/80 system = 70 lbs./hr. (2.3BHP)
    E) Total steam demand for AMV 120/160 system = 140 lbs./hr. (4.6BHP)

HIGH VOLUME COFFEE BREWING/HOLDING SYSTEM

PERFORMANCE CHART

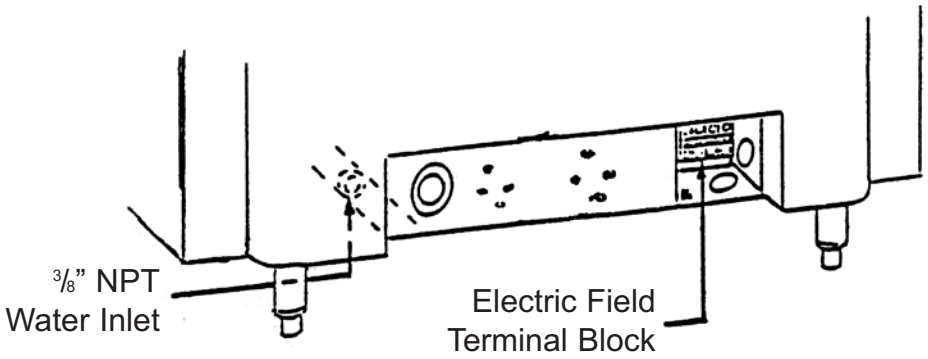
Model No.	AMV-60	AMV-80	AMV-120	AMV-160
Total Coffee Capacity Held	60 Gals.	80 Gals.	120 Gals.	160 Gals.
Brewing Urn(s)	One Twin 10 Gal.	One Twin 10 Gal.	Two Twin 10 Gal.	Two Twin 10 Gal.
Brewing Urn Holding Capacity	20 Gals.	20 Gals.	40 Gals.	40 Gals.
Holding Urn Capacity	40 Gals.	60 Gals.	80 Gals.	120 Gals.
Total Capacity Brew Time	45 Min.	60 Min.	45 Min.	60 Min.
Transfer Time	10 Min.	15 Min.	10 Min.	15 Min.
Total Preparation Time (No Heat Up)	55 Min.	75 Min.	55 Min.	75 Min.
Equivalent No. 5 oz. servings	1500	2000	3000	4000
Equivalent No. 6 oz. servings	1250	1700	2500	3300

Based on spraying over 10.5 gallons water each batch.
Based on simultaneous 2-side brewing.
Based on connection to 140^0 F. hot water supply.

Brew Urn Installation

1. Position urn so that the faucets drip into a drain trough or drain receptacle of some type.
2. Level urn both front to back and left to right. The feet are adjustable for this purpose.

Utility Connections



***IMPORTANT*: DO NOT RUN TUBING, PIPES, CONDUIT OR CABLE UNDER CENTER PORTION OF URN. THIS AREA MUST BE KEPT CLEAR FOR SERVICING URN CONTROLS.**

Water

1. 140^0 F. hot water must be used.
2. Provide shutoff valve and union in supply line near urn.
3. Minimum operating pressure at urn should be 30 PSI.
4. Maximum pressure recommended at urn is 75 PSI.
5. Copper or aluminum tubing should be used for flexiblity and avoiding strain on the urn.
6. To insure pressure at the urn of at least 30 PSI, use 3/8" O.D. tubing for short runs, 1/2" O.D. tubing for longer runs, and larger size tubing for unusually long runs.

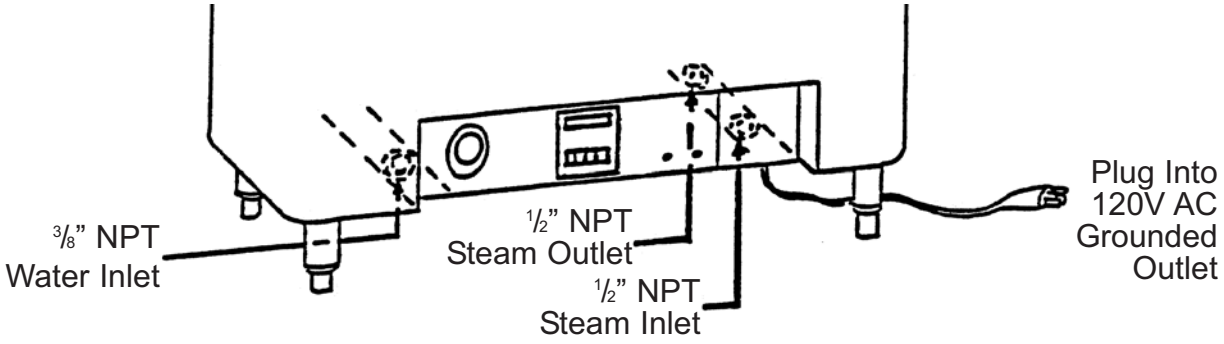
Electric

1. An experienced electrician should be responsible for connecting urn to electric power.
2. Check rating marking on urn to be sure supply lines match voltage and phase requirements.
3. Neutral wire normally required on all single phase and on 208 Volt three phase power supplies to operate 120 Volt AC control circuit. If single phase, 2 wire service (no neutral) or 3 phase 3 wire service (no neutral), a 3-wire cord and plug is supplied on the urn for 120 Volt AC 15 amp power connection to the pump and control circuit.
4. A fused disconnect switch should be installed near urn.
5. Urn body must be grounded. A grounding conductor terminal is provided for this purpose. Other means of positively grounding urn may be used.
6. Use only copper wire to connect this urn.

Installation

1. Position urn so that the faucets drip into a drain trough or drain receptacle of some type.
2. Level urn both front to back and left to right. The feet are adjustable for this purpose.

Utility Connections



***IMPORTANT*: DO NOT RUN TUBING, PIPES, CONDUIT OR CABLE UNDER CENTER PORTION OF URN. THIS AREA MUST BE KEPT CLEAR FOR SERVICING URN CONTROLS.**

Water

1. Cold or hot water may be used. Heat input capacity is ample for the coldest water, and cold water should be used for best results.
2. Provide shutoff valve and union in supply line near urn.
3. Minimum operating pressure at urn should be 30 PSI.
4. Maximum pressure recommended at urn is 75 PSI.
5. Copper or aluminum tubing should be used for flexibility and avoiding strain on the urn.
6. To insure pressure at the urn of at least 30 PSI, use 3/8" O.D. tubing for short runs, 1/2" O.D. tubing for longer runs, and larger size tubing for unusually long runs.

Steam

1. Steam supply line should have a shut-off valve ahead of urn. (A steam strainer and solenoid valve are located in the urn controls compartment.)
2. Steam return line should be connected to a high quality steam trap. Also, including a bypass and test valve to check trap operation while in service is recommended.
3. Use unions and/or copper tubing on both the supply and return connections to avoid strain on urn.

Electric

Plug 3-wire cord into nearby 120V AC outlet to provide power for urn controls. Note: Outlet must be a grounding-receptacle type.

Holding Urn Installation

1. Position urn on a sufficiently braced and reinforced stand or counter--a full 120 gallon holding urn weighs more than 1200 pounds.
2. Locate urn so faucets drip into a drain trough or drain receptacle of some type.
3. Level urn both front to back and left to right. The feet are adjustable.
4. Bolt feet to counter.

Utility Connections

Water

1. Connect 140^0 F. or hotter water to the spray rinse unit. Connection is 3/8"NPT, located center rear just below the bottom of the urn body.
2. Provide shutoff valve and union in supply line near urn.
3. Minimum operating pressure at urn should be 30 PSI.
4. Maximum pressure recommended at urn is 75 PSI.
5. Copper or aluminum tubing should be used for flexibility and avoiding strain on the urn.
6. To insure pressure at the urn of at least 30 PSI, use 3/8" O.D. tubing for short runs, 1/2" O.D. tubing for longer runs, and larger size tubing for unusually long runs.

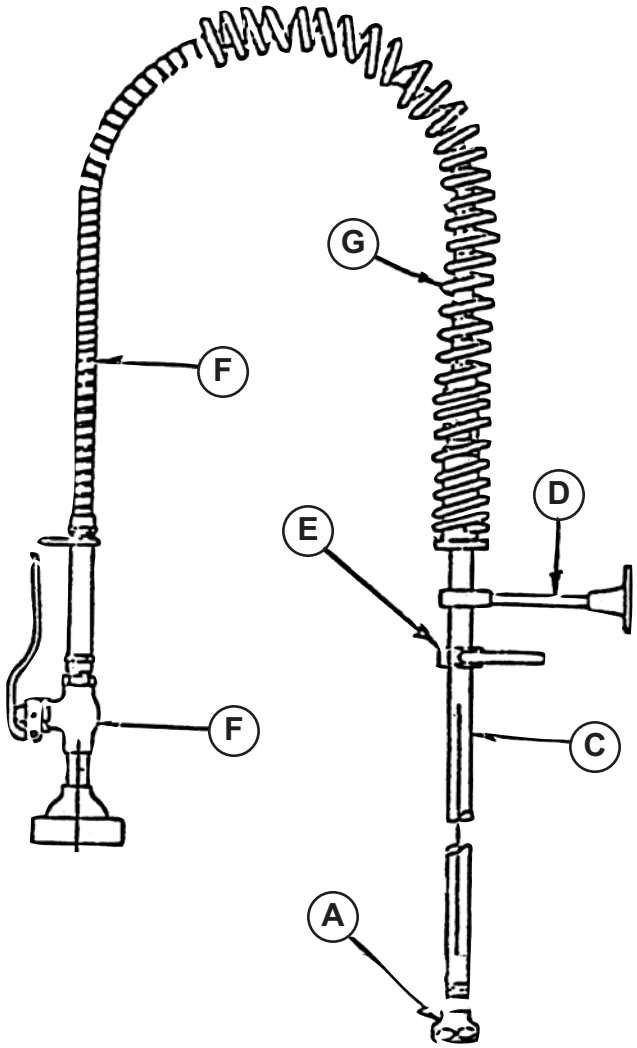
Electric

1. Holding urn must have its own 120V, single phase, 3 wire (grounded) 20 amp circuit. Heater load = 16.5 amp.
2. Connect provided 3-wire cord and plug into NEMA style 5-20R receptacle.
3. A fused disconnect switch should be installed near urn.

Transfer Hose Connections

Stainless steel braided, teflon lined hoses connect the holding urn to the brew urn(s). Hose fittings are located on the top rear of each brew urn side pump housing and on the top of the holding urn. The hoses have different lengths--connect the shortest to the pump housing nearest to the holding urn, longest to the furthest away.

For 919-S Pre-Rinse R1SEK, Hose & Spray



1. Assemble body adapter ‘A’ to body with Loctite or adhesive.

2. Remove insulated handle & spray ‘B’ from hose assembly.

3. Assemble pipe support ‘D’ and hose hook ‘E’ to riser ‘C’.

4. Install riser ‘C’ to body adapter ‘A’.

5. Assemble hose ‘F’ to riser coupling.

6. Slip gooseneck spring ‘G’ over hose ‘F’.
   NOTE: Top of spring has short radius bend.

7. Reconnect spray valve and insulated handle ‘B’ to hose ‘F’.

The Chicago Faucet Company
T-90
I ’77

Operation Start-Up: Brew Urn

1. Turn on power supply to urn. Open water supply line valve to urn. Water compartment will fill automatically. In case of failure to fill, refer to Automatic Refill service instructions page.

2. Turn thermostat knob on front of housing to BREW position. Pilot light at top of thermostat bezel should light up. Water in urn should heat up, and thermometer pointer rise to "W" in the blue BREW zone on thermometer dial, within approximately 45 minutes, depending on temperature of water in urn. Pilot light at top of thermostat bezel should go out when water in urn is at brew temperature. This pilot light will also go out in case of dangerous low water conditions, or no power at urn due to blown fuse, switch off, etc.

Operation Start-Up Checks/Brew Cycle Adjustments

1. Turn thermostat dial to BREW position. Pilot light at top of thermostat bezel should light up and when thermometer pointer is at "W" in BREW zone, this pilot light should go out. Water in urn tank is now at brew temperature. NOW and ONLY at initial start-up, we advise checking time of flow of hot water to spray nozzle.

2. Checkinq Sprayover Volume and Rate (Repeat for each sprayarm)
   Remove cover from brew basket over one liner. Position spray nozzle over this brew basket. Liner should be empty and faucet shut off. Push in timer start button and brew pilot should light up. Hot water should start to spray into brew basket. Allow to spray until brew pilot light goes out and sprayover stops.

   Measure amount sprayed over by drawing off into a calibrated one gallon measure. If amount is more or less than desired, reset timer. Longer time - more sprayover, shorter time - less sprayover. Each ¼ minute increase or decrease adds or subtracts about ¼ gallon to sprayover total. Note that setting of sprayover bypass valve (on sprayarm) affects amount of sprayover.

   Further adjustment of sprayover volume can be made using the internal bypass valve located in the side pump housing. Screwdriver adjustment is under the hole plug closest to the urn body. Open the valve for less sprayover, close for more. Valve is wide open when screwdriver slot is horizontal. It is closed when slot is vertical; i.e., pointing towards sprayarm for maximum sprayover. Purpose of the internal bypass valve is to direct excess discharge from the sprayover pump back into the urn water compartment.

   Factory setting is 10 gallons sprayover water in 10 minutes (1 gallon/60 seconds) and spray-over bypass valve wide open. Bypass volume is about 30% of the total sprayover, or 3 gallons.

Before actual use of urn, it should be thoroughly cleaned and washed. It is also recommended that a batch of coffee be brewed in each liner based on a final brewing cycle timer setting and actual muslin bag or filter to be used. We recommend that these first batches be thrown out and not used. Strength of brew may be checked by hydrometer or evaporation tests but flavor test might be poor on first batch.

Operation Start-Up: Holding Urn

1. Turn on power supply to urn. Open water supply line valve to urn.

2. Turn on master switch. Indicator light should be lit; if not, check power supply for blown fuse, disconnect switch off, etc.

3. Remove cover and manually spray rinse water into urn. If spray is not hot, run water until it is, then drain the initially cool water through the front faucets. (If this is not done, the urn will take an abnormally long time to heat up.) Fill urn until water level rises above thermometer.

4. Urn should heat up until thermometer pointer reaches low end of blue Brew Zone. Internal thermostatic control should maintain this setting of 180^0-190^0 F.

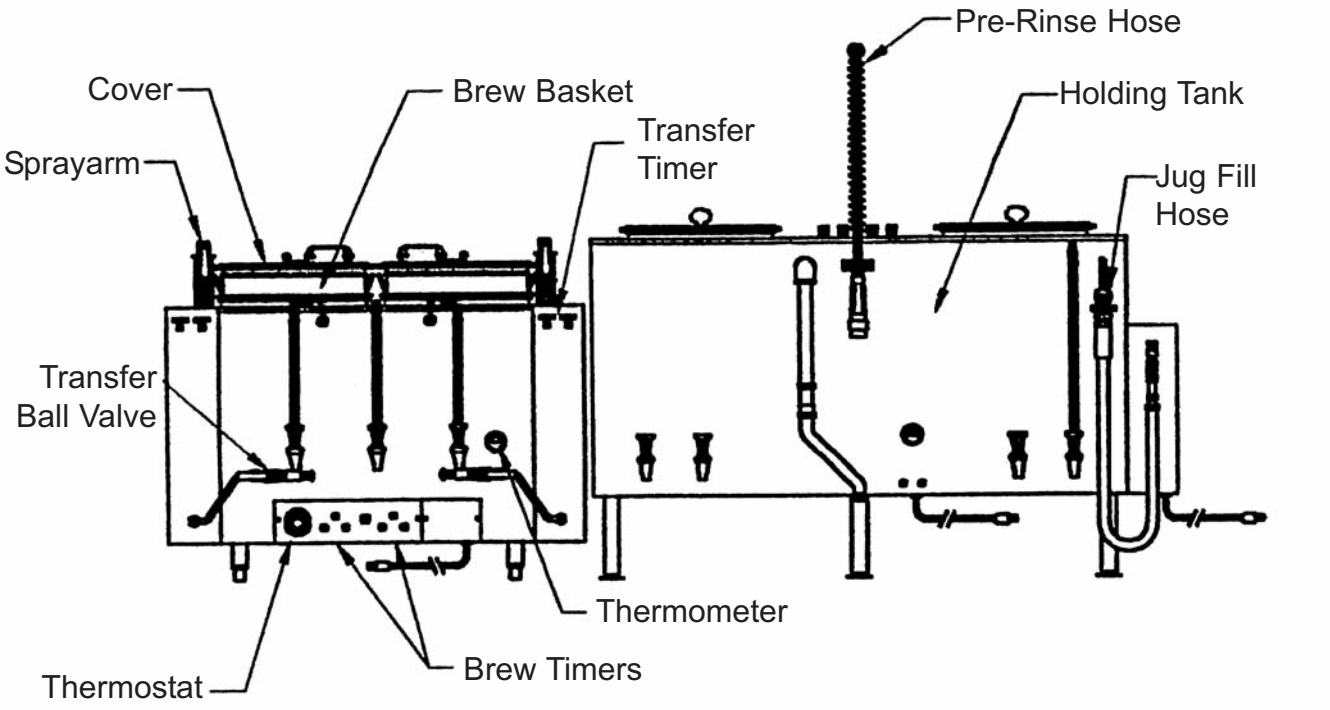
Operation Start-Up Checks: Transfer System

1. With brew urn(s) up to temperature, spray full brew volume into each coffee liner.

2. When sprayover is complete, open transfer ball valve, located on urn front, by moving handle to horizontal position.

3. Push start button on front of pump housing to begin timer-controlled transfer. The pilot light should light up indicating transfer in process.

4. The transfer pump and pilot light should shut off soon after the full liner is empty. If too soon, adjust timer for longer time. Factory setting is 4½ minutes for a full 10 gallon liner.



How To Brew In An Automatic Urn

1. Place filter in brew basket with designated amount of ground coffee (automatic urns are designated to use 1, 2, or 3 lbs. of coffee). Make certain the coffee has a level bed depth of at least 1 1/2" to 2".
2. Replace cover and move spray head over center of coffee grounds.
3. Check thermometer to make certain urn is at brewing temperature; pointer should be at high end of brew zone. Press START button.
4. When brew cycle is completed, remove brew basket and dispose of spent grounds.
5. Mixing of finished brew is accomplished automatically at the end of the drip-through cycle.
6. When mixing of the finished brew is completed, open transfer ball valve, located on urn front, by moving handle to horizontal position.
7. Push start button on front of the pump housing to begin timer-controlled transfer. The pilot light should light up indicating transfer in process.
8. The transfer pump and the pilot light should shut off soon after the full liner is empty. If too soon, adjust timer for longer time. Factory setting is 5 1/2 minutes for a full 10 gallon liner.

9. Coffee is ready to serve.

How To Brew In An Automatic Urn

1. Place filter in brew basket with designated amount of ground coffee (automatic urns are designed to use 1, 2, 3 or 4 lbs. of coffee). Make certain you have a level bed of coffee. Consult your coffee supplier for exact brewing specifications. (C.B.C. recommendation is 1 lb. of coffee to each 2 ½ gallson water).

2. Replace cover and move spray head over center of coffee grounds.

3. Check thermometer to make certain urn is at brewing temperature. Press timer button.

4. When brew cycle is completed (brew light shuts off), remove brew basket and dispose of spent grounds.

5. Mixing of finished brew is accomplished automatically at the end of the brew cycle if the urn has an air agitation option. Additional mixing can be performed at later time by pressing manual air agitation push button.

   Where urn is not equipped with air agitation, draw one gallon for each three gallons of finished brew from coffee faucet, and pour over top into coffee liner.

6. Coffee is ready to serve.

7. Hold coffee at 185° - 190° F. or HOLD setting on thermostat knob. Brewed coffee can be held at this temperature for up to one hour with minimal deterioration of flavor and body.

Explanation Of Brewing Cycle

1. When timer button is pushed, the timer is activated.

2. The timer completes the circuit to the sprayover pump which delivers hot water through the spray arm to the spray nozzle.

3. The hot water from the spray nozzle is sprayed over the coffee grounds. The finished brew collects in the coffee liner.

4. As the pump delivers hot water from the water compartment through spray nozzle into brew basket, the water level in the water compartment lowers.

5. Drop in water level in water compartment below sensing probes activates liquid level control which opens the refill solenoid valve, refilling the water compartment with fresh water.

6. The entry of the water activates the thermostat, which allows power to go to the heating element to maintain the brewing temperature.

NOTE: All urns are equipped with an adjustable bypass valve on the spray arm. Adjustment of this valve will allow some spray water to bypass the brewing basket for additional control of the water/coffee brewing formula and the extraction percentage from the coffee.

Variable brewing factors which the coffee urn <u>cannot</u> control are:

1. The uniformity and type of grind on coffee supplied.
2. The uniformity and quality of roasting, and selection of blend and type of coffee beans used, and the freshness of ground coffee used in a brew.
3. Water chemistry - i.e., mineral content, taste factors, (chlorine, flourine, iron, etc.) and effects of any treatment process occurring ahead of urn.
4. Uniformity and quality of filter paper is also important, and proper storage and handling of paper affects final brew.
5. Proper and regular, frequent cleaning of all coffee brewing equipment is vital to insure the most delicious tasting brew.

Variable brewing factors which this coffee urn <u>can</u> control are:

1. Contact time of water with ground coffee.
2. Accuracy of water spray-over volume.
3. Temperature of water spray-over.
4. Holding temperature of finished brew.
5. Proper and uniform extraction over coffee brew basket bed area.
6. Proper coffee bed depth in brew basket.
7. Proper and thorough mixing of first rich brew with later, weaker brew for uniform final brew.

Final decision of brewing formula and brewing cycle adjustments rests with the operator and the coffee suppliler.

OPT. 121 - Overfill protection

In the event of an operator errror to transfer coffee while the holding tank is full, this option will disable the transfer timer which will shut off the pumps and prevent the holding tank from overfilling.

Filter Screen For Coffee Grounds

This automatic urn includes 2 filter screens. They are located. inside the coffee liners, resting near the bottom. Their purpose is to prevent blockage or clogging of coffee transfer pump hose system caused by careless operator, torn or defective filter paper, or overfill of coffee brew basket. Filter screen must be in position at all operatinq times in both liners.

Filter screen should be removed and rinsed after each batch brewed, at the same time that coffee liner is rinsed out.

Daily rinse off advised.

Weekly wash through dishwasher cycle, or by cleaning with coffee removal compound such as:

Dip-It -- Economics Lab
Oxylite -- Avril, Inc. Syndet Division
Temp-Kleen -- Caddy Corp. of America

Transfer System Operation

1. Whenever the coffee holding urn is to be used, switch it on while the first brewing operation(s) are going on in the brew urn(s). This will allow the holding urn to be up to temperature for the first transfer of freshly brewed coffee.

2. The sanitary, teflon-sealed, ball valves on the brew urn front must be kept closed (handle down) except when transferring coffee, or cleaning the system. After completing a brew in one liner, open its ball valve by moving the handle up to horizontal. This will feed coffee to the transfer pump.

3. Before transferring coffee, check the calibrated gauge on the front of the holding urn. If the coffee level is near full, do not transfer until coffee has been drawn off to a safe level. If okay to transfer, push START button on front of side pump housing. The pilot light should light up indicating transfer in process.

4. After the timer controlled transfer pump shuts off, and the pilot light goes out, close the ball valve by moving its handle down. Rinse out the brew liner.

5. Ready for next brew.

NOTE:
Coffee may be transferred from all brew liners at the same time provided that there is room left in the holding urn. DO NOT overfill the coffee holding urn. Poushing the STOP button on the side housing will shut off the transfer pump.

Solid State Coffee Agitation System

Coffee agitation is accomplished with low pressure air, bubbling up through coffee in liner. Air enters at top coffee gauge elbow fittings and forces coffee down out of sight in gauge glasses during agitation period. Air continues through into liner connection elbow, and bubbles up from this center fitting. The rich, heavy portion of brew is carried up to the top and thoroughly mixed with weaker top level coffee.

Automatic Program - End Of Brew And Delayed Types

At the end of the spray cyle, the air pump turns on for about 30 seconds automatically. This automatic agitation program is either built into the solid state spray cycle (brew) timer or is provided by a separate solid state agitation relay on equipment with mechanical timers. Urns with delayed air agitation (Option 43D) have a two minute delay after the end of the brew cycle before the 30 second agitation cycle starts for improved mixing. This delayed program is provided by a separate delay solid state relay. Whenever power to the urn has been off, such as upon installation, the automatic agitation program will begin as soon as the power is turned on. Otherwise, it operates only after the end of spray.

Manual Agitation

At any desired time, holding in the "manual agitation" black push button switch will blend stored coffee.

Note: The plug in cleanout cap at the top of the coffee gages must be pushed in completely to avoid air leaks. Gauge glasses are, cleaned with a gauge brush by first lifting out the top cap. (A slight twist will release a tightly sealed cap). Be sure to replace the cap properly so that the agitation system can operate.

WARNING: Overfilling coffee liners may damage air pumps, NEVER overfill liners at any time.

Coffee Agitation System (Automatically Programmed)

Coffee agitation is accomplished with low pressure air, bubbling up through coffee in liner. Air enters at top coffee gauge elbow fittings and forces coffee down out of sight in gauge glasses during agitation period. Air continues through into liner connection elbow, and bubbles up from this center fitting. The rich, heavy portion of brew is carried up to the top and thoroughly mixed with weaker top level coffee.

OPERATION
30 second agitation at end of spray cycle is automatic. At any additional time to agitate stored coffee, push black button and hold as long as desired to agitate.

DELAYED AGITATION
Some urns are equipped with delayed automatic agitation. In these urns, agitation begins 1 1/2 to 2 minutes after spray cycle ends and continues for the normal 30 second coffee blending period.

WARNING
OVERFILLING COFFEE LINERS MAY DAMAGE AIR PUMPS. NEVER overfill liners at any time.

SERVICE - IF NO AIR
Make sure all tubes are tightly connected. Check pump. Check for leaks at gauge glass, at top or bottom and at top cleanout caps. (May require new "O" ring on top cap.)

The top cap of the Deluxe Top Coffee Gauge Cleanout Fitting for Air Agitation MUST BE COMPLETELY PUSHED INTO the upper gauge fittings. Gauge glasses can be cleaned with gauge glass brush by first lifting out the top cap from the upper gauge fitting.
In operation, the top cap must be in place for agitation to operate.

TO CHECK TIMING
If timing is too short, or too long, check solid state timing relay.

Cleaning Urn

After emptying a liner of coffee, liner should be flushed out. Push start button. After 30 to 60 seconds, push red stop button switch. Spray will rinse liner very effectively with scalding hot water. Thorough daily cleaning after last batch of coffee is brewed should be a must procedure. Use ample amount of hot water with brush, and clean draw-off tube ana faucets and gauge glasses. At least once a week, use a good urn cleaner to clean urn. Be sure to thoroughly rinse after any cleaning operation with several gallons of hot water.

Care and Cleaning Of Coffee Urns

1. Always rinse urn immediately after each use.
2. Add small quantity of hot water, brush sides and rinse with hot water until it runs clean. Urn is now ready for next batch.
3. At end of each day clean and brush urn several times, then rinse thoroughly with hot water.
4. Remove clean-out cap at end of coffee faucet (or take apart faucets which have no caps) and scrub pipe leading to center of urn. Clean urn gauge glass with brush and urn cleaner. Rinse!
5. Scrub the faucet, then rinse it thoroughly with hot water.
6. Place a gallon or more of fresh water in urn until next use.
7. Remove cover and clean. Replace cover, and leave partly open.
8. ALWAYS REMEMBER TO EMPTY, AND RINSE THE URN WITH HOT WATER BEFORE USING AGAIN.

NOTE: On automatic urns, use brew start and stop switches, or the rinse switch, to spray scalding hot water into liner for cleaning and rinsing. On pourover urns, draw hot water directly from urn. Make sure urn water tank is kept near full, and heat is on.

Semi-Weekly Cleaning Procedure

1. Be sure outer jacket is full of water.
2. Turn on heat and fill urn liner 3/4 full of water; use only urn cleaning compounds, following manufacturer's directions; mix thoroughly and let stand about 30 minutes.
3. Clean gauge glasses, faucet pipe, plugs, etc. using long thin brush. Use urn cleaning solution for scrubbing. Take faucet valve apart and clean thoroughly. Clean all tubes well.
4. Scrub inside of urn and inside of cover with long handled brush. Be sure to clean "lug nut" in base of urn liner.
5. Rinse inside of urn three or four times with hot water -- scrubbing each time. Also rinse parts well. Repeat until all traces of foreign odor and cleaning solution are removed.
6. Leave a gallon or more of fresh water in urn with cover partly open until next use. If cold water is used, allow urn to cool to prevent cracking liner.
7. Urn baskets may be cleaned by immersing in urn cleaner solution and scrubbing with a stiff brush. Rinse thoroughly and let dry Sprayheads should be checked to see that all holes are open. If any are clogged, remove sprayhead and use stiff wire to open.
8. Don't use soap, scouring powders, or abrasives to clean coffee brewing: equipment.

WARNING: Cleaner used can affect taste of coffee if not thoroughly flushed out as covered above.

NOTE: Coffee system cleaners that have been used successfully:

DIP-IT manufactured by Economics Laboratories, Inc.
4 Corporate Park Drive, White Plains, NY 10604

OXYLITE manufactured by Avril, Inc., Syndet Division
601 N. Third Street, Reading, PA 19601

TEMP-KLEEN manufactured by Caddy Corp. of America
Pitman, NJ 08071

Specific Instructions For Cleaning Transfer System

NOTE: A. These cleaning instructions are in addition to the regular care and cleaning of coffee urn instructions found on another page in this manual.
B. These specific instructions must be followed after each use of the transfer system.

1. Cleanout plugs are found on the elbows beneath the coffee brew liner faucet shanks. These should be opened and liner rinse water allowed to flush out the fittings in front of the transfer ball valves.

2. After flushing, open the ball valves and insert a gauge glass brush through the cleanouts to scrub the transfer line up to the pump. Note that the brush can be shaped so that the bristles reach all the way to the pump housing. Do not insert the brush too far as its tip may puncture the flexible tubing inside the housing.

3. Plug the cleanouts. Keep the valves open. Make sure the urn is up to temperature. (The holding urn need not be turned on.)

4. Spray over half volume of hot water into each liner. (Push BREW STOP button when water reaches middle of gauge.) Add about 4 tablespoons of coffee system cleaner to each liner.

5. Transfer cleaning solution from each liner to holding urn.

6. After transfer is complete, open all liner and holding urn faucets to drain cleaning solution.

7. While cleaning solution is being drained, fill each liner halfway again.

8. Close faucets. Transfer hot rinse water from each liner to holding urn.

9. Repeat steps 6, 7, and 8.

10. Drain rinse water as before.

11. Close faucets. Close transfer ball valves.

WARNING: Cleaner used can affect taste of coffee if not thoroughly flushed out as covered above.

NOTE: Coffee system cleaners that have been used successfully:

DIP-IT manufactured by Economics Laboratories, Inc.
4 Corporate Park Drive, White Plains, NY 10604

OXYLITE manufactured by Avril, Inc., Syndet Division
601 N. Third Street, Reading, PA 19601

TEMP-KLEEN manufactured by Caddy Corp. of America
Pitman, NJ 08071

Service Instructions

Mineral or lime content of water is the major factor determining frequency of cleaning of water heating circuit which includes solenoid water valve, strainer, spray arm, spray nozzle, bypass valve, sprayover pump 'and water tank. We recommend that a Poly phosphate type of water treatment be used where hardness of water is a problem. Such units are manufactured by: 'Ever Pure, Inc., Westmont, IL, Calgon Co., Pittsburgh, PA. Contact your equipment dealer, sales representative, or a plumber to find out about this vital water treatment problem in your location. It may even be necessary to consult a water treatment engineer to solve a difficult problem in particular areas.

Generally speaking, water over 7 or 8 grain hardness can cause trouble in this equipment. We cannot guarantee urn against operational problems caused by liming or scaling.

We do provide a large capacity strainer on the water line to protect the water solenoid valve and flow control valve from being affected by suspended particles. This strainer should be cleaned by removing plug on screen and washing screen every 3-6 months or year, depending on local water conditions.

Thermostat Adjustment

1. If water temperature is below "W" in BREW zone on thermometer dial with knob on BREW setting, remove knob by pulling straight outward. Using small screwdriver, insert in hole in center of shaft, turn slotted screw counterclockwise until red pilot light goes on. Check to see that water in urn holds at "W" in BREW zone on thermometer and does not boil.

2. If water boils with thermostat knob set at the BREW position, remove knob by pulling straight outward. Using small screwdriver, insert into hole in center of shaft, turn slotted screw clockwise until red pilot light goes out. Hold shaft so it does not turn while adjusting screw. Add cold water and check that heat comes back on (pilot light glows), and that thermostat cycles at temperature at HI end of BREW zone on thermometer dial.

   If thermostat will not cycle, replace entire control.

Push Button Timer For Spray Over Control

The function of the timer is to start the pump and run it for a preset period of time and upon lapse of this time, to stop the pump, thereby completing the spray over cycle.

This urn is equipped with an electric reset timer. Pushing in the START button will start the flow of water. The timer will complete the time cycle for which it has been programmed and on completion, the flow will be stopped and the timer will reset itself, ready for the next brewing cycle.

If electric power is cut off anywhere in the service coming to the urn during the timer operating cycle, the timer will reset. When the power is restored, the timer must be restarted by pushing the START button.

Space Saver Urn Service Instructions

Electrode Assembly

The electrode assembly that is used to detect the water level for American Metal Ware auto refill and low water cutoff systems is mounted through the center portion of the urn top, at the rear. Remove the cover to gain access to the electrodes for cleaning off any mineral scale buildup. See Service Bulletin 4 pages for further information.

Controls Compartment Servicing

The controls for the Space Saver urn are mounted on a drawer which drops down and pulls out for complete access. This drawer is held up in the urn base by a rear support angle and mounting screws in the front control panel face. Follow this procedure when performing any service of the components located in the drawer compartment:

A. TURN OFF POWER.
B. Giving temporary support underneath the front of the controls compartment (your hand or fist will do), remove the mounting screws.
C. Carefully lower the drawer to the countertop and pull it completely forward for full access to all components.
D. Note that some parts are attached to the actual urn bottom, in the upper area of the controls compartment. These parts include: the water inlet assembly, thermostat bulb, and steam solenoid assembly or electric heater terminals (depending if urn is steam or electric heat).
E. When putting the drawer back in position, take care that all wires and the thermostat capillary tube are free from being caught or pinched.

Service/Troubleshooting Solid State Air Agitation

A vibrator air pump is located in the control box. This pump supplies the air to the coffee liners. It is turned on directly by pushing the manual agitation switch, and automatically by the brew timer or solid state relay in series with the brew timer.

The manual agitation switch is a momentary contact, normally open single pole black push button switch. Depressing the button closes the switch contacts completing the circuit to the air pump. It is wired parallel to the automatic agitation circuit.

The automatic 30-second (approx.) operation of the air pump is provided by the output of the solid state brew timer or a separate solid state agitation relay in series with the brew timer. The delayed automatic agitation program (2 minute off time between end of spray and start of 30 second agitation) uses a delay solid state relay in series with the brew timer.

The following troubleshooting guide assumes that internal wiring is correct and 120V AC power is provided.

1. IF COFFEE LEVEL DOES NOT RISE BACK IN GAUGE GLASS, or is unusually slow to come backup, the very small vent hole in the clean out cap is clogged. Clear vent using a straight pin or similar object.

2. IF AGITATION DOES NOT STOP, check for sticking manual agitation switch. Where automatic agitation is built into timer, and manual switch checks okay, timer is defectiveand should be'.replaced. Where automatic agitation is a separate solid state agitation relay and manual switch checks okay, the relay is defective and should be replaced. If there is a constant "low" air pump output, the solid state timer or relay.is defective and should be replaced.

3. IF NO AIR ENTERS LINER, check output of pump through outlet fittings on urn front. If okay, then make sure all connections are tight. Check for leaks at gauge glass, at top, bottom and at cleanout cap. May require new o-ring or silicone grease on top cap; upper or lower gauge glass washer; or, if chipped or cracked, new gauge glass. Also, make sure passageways through top cap and gauge base are clear.

4. IF LITTLE OR NO AIR COMES THROUGH FITTINGS ON URN FRONT, open the control box and check the pump operation. If pump operates, but has weak output, replace it. If air pump is okay, air lines between control box and front fittings are blocked or leak. Blockage usually is caused by overfilling liners. Use stiff thin wire to clear. If air lines leak, coffee liners are removed first, then tighten compression fittings at each end of lines.

5. IF NEITHER AUTOMATIC'NOR MANUAL AGITATION OPERATES PUMP, pump is most likely defective and should be replaced.

6. IF AUTOMATIC AGITATION IS OKAY, BUT MANUAL DOES NOT WORK, replace manual agitation switch.

7. IF MANUAL AGITATION WORKS, BUT AUTOMATIC DOES NOT, replace the solid state brew timer or separate solid state agitation relay.

Operation Malfunction and Service

PROBLEM - THERMOSTAT DIAL TURNED TO BREW AND WATER IN TANK REMAINS COLD

POSSIBLE CAUSE	SERVICE CHECKS AND CURES
1. No power at urn.	Check main switch. Check main fuses. (Three on 3 phase power, two on single phase power). Check that pilot light at top of thermostat bezel is ON.
2. Power at urn, but no power at heater terminals.	Check urn control circuit breaker or fuse. Reset or replace if needed. Check that water level is at STOP mark on gauge. Check that power contactor has power at coil, and clicks open and closed at thermostat dial is turned off and to BREW position. Check control transformer, if supplied. It may be burned out. Lastly, check for voltage at heater terminals. If voltage at heater is O.K., check for broken or loose wire. Water must be showing in center gauge glass 2" if Opt. 39 equipped.
3. Power at heater terminals, but no heat.	Check heater for an open circuit with ohmeter or continuity tester. If necessary, replace heater. (It is necessary to remove coffee liner to replace electric heater).

PROBLEM - WATER BOILS CONTINUOUSLY WITH THERMOSTAT DIAL ON POSITION "BREW" OR "HOLD".

POSSIBLE CAUSE	SERVICE CHECKS AND CURES
1. Thermostat out of calibration.	Set knob on BREW and remove knob by pulling outward. Using small screwdriver in center of shaft, turn slotted screw clockwise until pilot light goes out. Check holding temperature by adding cod water. Light should come on and water heat up to high end of "BREW" zone on thermometer dial and then shut off. NO BOILING.
2. Thermostat is inoperative. Fluid has leaked out of diastat assembly of thermostat.	If impossible to get control to cycle on and off and control temperature, replace entire control. Be sure to drain water in urn below level at which bulb enters urn. Also shut off all power before service is attempted.
3. Contractor sticking in closed position.	Contractor must click on and off. If it sticks, replace.

Operation Malfunction and Service (cont'd)

PROBLEM - LINE OR CONTROL CIRCUIT BREAKER (OR FUSE) TRIPS FREQUENTLY

POSSIBLE CAUSE	SERVICE CHECKS AND CURES
1. Fuse or breaker undersized.	Install circuit protector with proper amp rating.
2. Manual agitation push button grounds out intermittently.	Replace push button switch. Check with ohmeter.
3. Liquid level control malfunctioning.	Replace liquid level control.
4. Contractor coil defective.	Check coil for continuity and proper resistance and short to ground with ohmeter.
5. Solenoid valve coil defective.	Check coil for continuity and proper resistance and short to ground with ohmeter.
6. Pump motor defective.	Check pump motor for high operating temperature. Check with ohmeter for ground-out or burn-out.
7. Pump timer switch grounds out intermittently.	Check with ohmeter to ground. Replace defective unit.

PROBLEM - NO COFFEE TRANSFER

POSSIBLE CAUSE	SERVICE CHECKS AND CURES
1. Transfer ball valve in supply line clogged or shut off.	Clean and/or open valve.
2. Needs priming.	To prime, shut off coffee pump switch for 20 seconds. Restart and coffee should circulate through lines. (Make sure transfer ball valve is open.)
3. Transfer lines blocked.	Clean lines - see "Cleaning Instructions".
4. Pumps not working.	Check pump fuses. Check pump timer/switches. Check motor with live 120 volt test cord. Replace pump if necessary. Note: Overload protector thermostat on pump motor may cut off and on, under overload conditions, pump binding or clogged, etc. If condition persists, replace pump.

Dual Level Control Auto Refill and Low Water Cutoff System

I) Dual Level Control: What it does

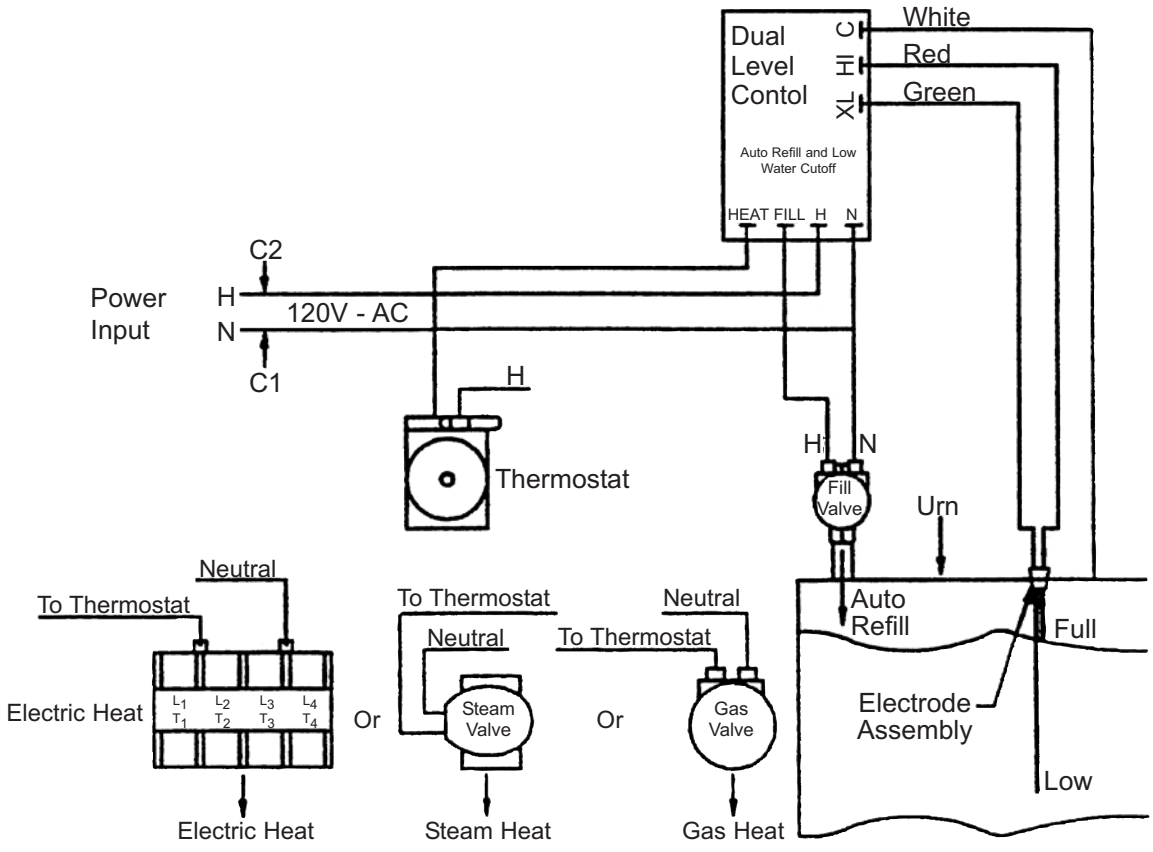
A. AUTO REFILL of the water compartment to keep the tank filled with water. When water is used, the fill valve opens automatically to let in more. The fill valve closes when water level reaches full.

B. LOW WATER CUTOFF to prevent burn out of the electric immersion heater when there is not enough water to cover it. When low water occurs, the heat automatically switches off. The heat stays off until more water is added.

C. A device called a DUAL LEVEL CONTROL keeps the tank filled with water and turns off the heat when water is low by simultaneously monitoring two different water levels.

II) Description and Operation of Dual Level Control System:

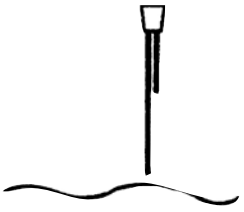
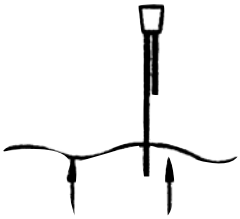
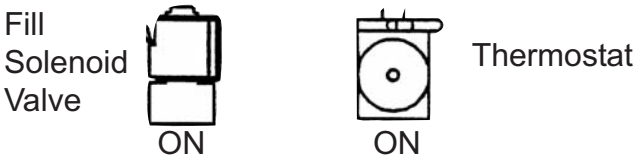
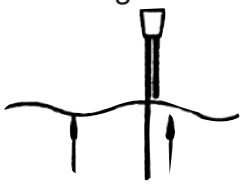
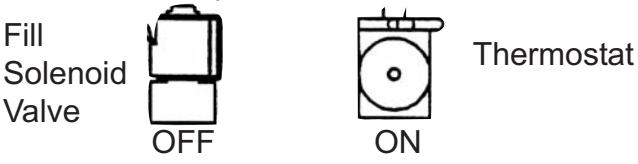
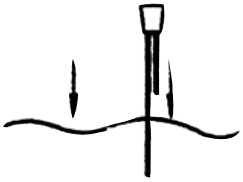
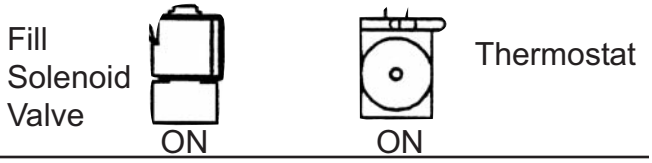
A. Components



090-488
1-15-92 WK

II) Description and Operation of Liquid Level Contol System (cont'd)

B. Operation

WATER LEVEL	ACTION
1. Below both electrodes. 	1. Electrode circuit open. Liquid level control turns on power to fill valve and turns off power to thermostat.
2. Rises to low electrode. 	2. Electrode circuit stays open. Power to fill valve remains on. Liquid level control turns power on to thermostat. 
3. Rises to high electrode. 	3. Electrode circuit closes. Liquid level control turns off power to fill valve and leaves power on the thermostat. 
4. Falls to below high electrode only 	4. Electrode circuit opens. Liquid level control turns power on to fill valve. Thermostat stays on. 
5. Falls to below low electrode	5. SAME AS STEP ONE, ABOVE.

III) Quick Service Check of Dual Liquid Level Control System:

1) <u>All</u> wires secure and properly connected.
2) Clean the electrodes. Lime (mineral scale) build-up can interfere with the operation of any liquid level control system.
3) Check the common (ground) connections. A little looseness or dirt can cause erratic operation.

090-489
1-15-02 WK

IV) Troubleshooting Auto Refill, Low Water Cutoff, and Dual Level Control System

PROBLEM	POSSIBLE CAUSE	SERVICE CHECK	REMEDY
A) Overfilling of water tank when power is off.	1) Fill solenoid valve leaking due to dirt or scale holding valve open, or worn plunger seat.	Visual. Water entering tank continuously, and usually slowly.	Disassemble and clean out. May require new plunger assembly. Caution is advised to avoid damage to valve. See valve instruction sheet.
	2) Fill solenoid valve installed backwards.	Visual.	*On valves without integral strainer:* Install so that port marked "IN" is connected to outside fresh watersupply. *On valves with integral strainer:* Install so that arrow points in direction of tank, away from fresh water supply.
B) Overfilling of water tank only when power to unit is on.	1) High electrode coated with scale, or faulty.	Jumper from "HI" terminal to metal enclosure stops fill.	Remove electrode assembly. Clean both electrodes. If still no remedy and connections are good, replace assembly.
	2) Missing or faulty common connection for electrode circuit ("C" terminal to metal enclosure).	Jumper "C" terminal (next to XL) to metal enclosure stops fill.	Make good secure connection. May require cleaning or replacement.
	3) Fill valve connected to "HEAT" terminal.	Visual.	Connect "BLACK" wire lead to "FILL" terminal.
	4) Dual Level printed circuit board faulty.	Jumper from "HI" to "C" does not stop fill.	Replace Dual Level Control.
C) Auto refill fails to fill water tank.	1) No power at equipment.	Nothing operates on machine.	Make sure main switch(es), fuse(s), circuit breaker(s) provide power to unit, that machine's circuit breaker is OK and power switch, if provided, is on.
	2) No water at equipment.	"Crack" fitting at water inlet for pressure check.	Make sure all water supply line valves are open.

IV) Troubleshooting Auto Refill, Low Water Cutoff, and Dual Level Control System (continued)

PROBLEM	POSSIBLE CAUSE	SERVICE CHECK	REMEDY
C) Auto refill fails to fill water tank (continued).	3) Water strainer clogged.	Water pressure before strainer and not after.	Remove and clean micromesh screen filter located in water strainer.
	4) No power on Dual Level Control.	Check for 120V AC across "H" and "N" terminals.	If voltage missing or incorrect, check wiring for looseness, breaks, and proper connections.
	5) Fill solenoid valve clogged with scale or frozen closed.	Disassemble.	Clean out and/or replace plunger assembly or entire valve. May require new coil. Caution is advised to avoid damage to valve. See valve instruction sheet.
	6) Fill solenoid valve coil inoperative	Jumper from "FILL" terminal to "H" terminal does not start fill.	Replace coil. Also check for forzen plunger. See valve instruction sheet.
	7) Electrodes shorting to ground.	Tank fills with electrode wire disconnected from "HI" terminal.	Replace electrode assembly. If no remedy, check for improper wiring (cut insulation) or electrode tips touching metal.
	8) Dual Level Control faulty.	Tank does not fill with electrode wire disconnected from "HI" terminal.	Replace Dual Level Control.
D) Auto Refill is erratic.	1) Electrode shorting to ground completely or intermittently.	Tank fills with electrode wire disconnected from "HI" terminal	Replace electrode assembly.
	2) Loose connection.	Visual. Check for "C" and "HI" probe terminals as well as "FILL." Also check neutral (white) wire at valve.	Push wire lead connector securely onto terminal(s). Replace connector if wire is frayed or broken.
	3) Dual Level Control faulty.	Tank does not fill with electrode wires disconnected from "XL" and "H" terminals.	Replace Dual Level Control.

IV) Troubleshooting Auto Refill, Low Water Cutoff, and Dual Level Control System (continued)

PROBLEM	POSSIBLE CAUSE	SERVICE CHECK	REMEDY
E) Tank fills with water, but heat does not come on.	1) Thermostat off.	Visual.	Make sure knob is turned fully clockwise.
	2) Thermostat inoperative or out of calibration.	Jumper across thermostat terminals causes heat to come on.	Recalibrate thermostat. If no remedy, or thermostat does not cycle, replace.
	3) Power relay or contractor inoperative.	Check for voltage (120V AC) across coil terminals.	If correct voltage, replace coil or entire device. If not correct voltage, check for loose wires, improper wiring or other cause.
	4) Low electrode faulty or covered with lime scale.	Jumper from "XL" terminal to metal enclosure allows unit to heat.	Clean electrodes. Check wiring. If still no remedy, replace electrode assembly.
	5) Dual Level Control faulty.	Jumper from "XL" terminal to "C" does not cause unit to heat.	Replace Dual Level Control.
F) No water in tank, but heat comes on (heater damage likely).	1) Thermostat and fill valve connected to wrong terminals on Dual Level Control .	Visual	Thermostat (brown wire) must be connected to "HEAT" and fill valve (black wire) to "FILL".
	2) Electrode(s) shorting to ground.	Disconnecting wire (white) from "C" probe terminal provides low water heat cutoff and tank fill.	Replace electrode assembly. If no remedy, check for improper wiring (cut insulation for instance), or electrode tips touching metal inside tank.
	3) Dual Level Control faulty.	Heat comes on with no probe wires (HI, XL, C) connected.	Replace Dual Level Control.

NOTE: The level control board works on the principle that water is conductive and with some pure water installations an increased sensitivity may be required in the level control system. Consult factory if this be the case.

If you still need help, call an authorized dealer in your area or Grindmaster Corporation's Technical Service Department. You can reach Technical Service at (800) 695-4500 (USA & Canada only) or (502) 425-4776 Monday-Friday, 8:00 AM - 6:00 PM Eastern Standard Time. Please have the model and serial number ready so that accurate information can be given.

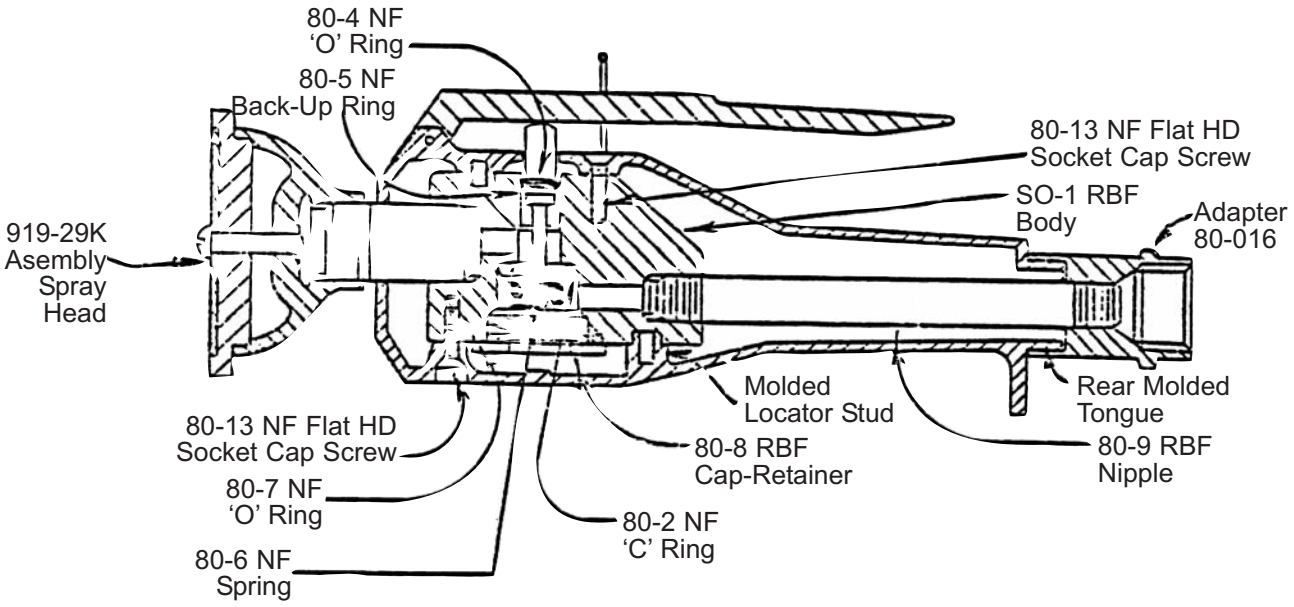
Prior authorization must be obtained from Grindmaster Corporation's Technical Service Department for all warranty clamins.

Instructions For Repairing

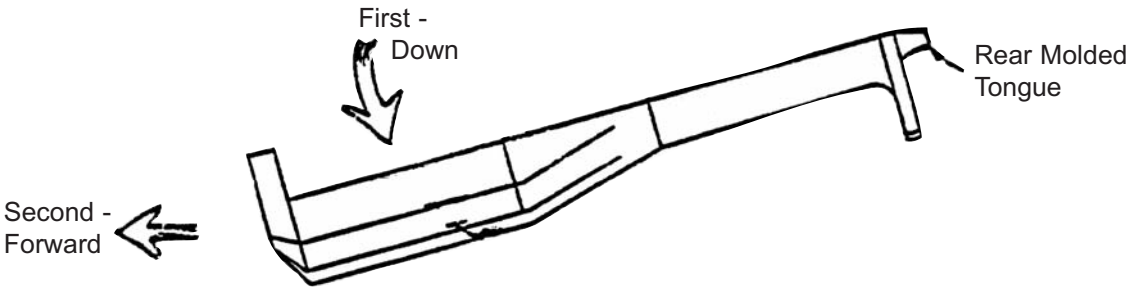
Pre-Rinse Valve Unit

#80, 81, 82, 84, 502, 509, 509GC, 510, 510GC, 512, 512GC, 535, 536, 537, 538, 538WC, 549, 919, 919S, 920, 923, 923GC

Before beginning this procedure, turn water off at source.



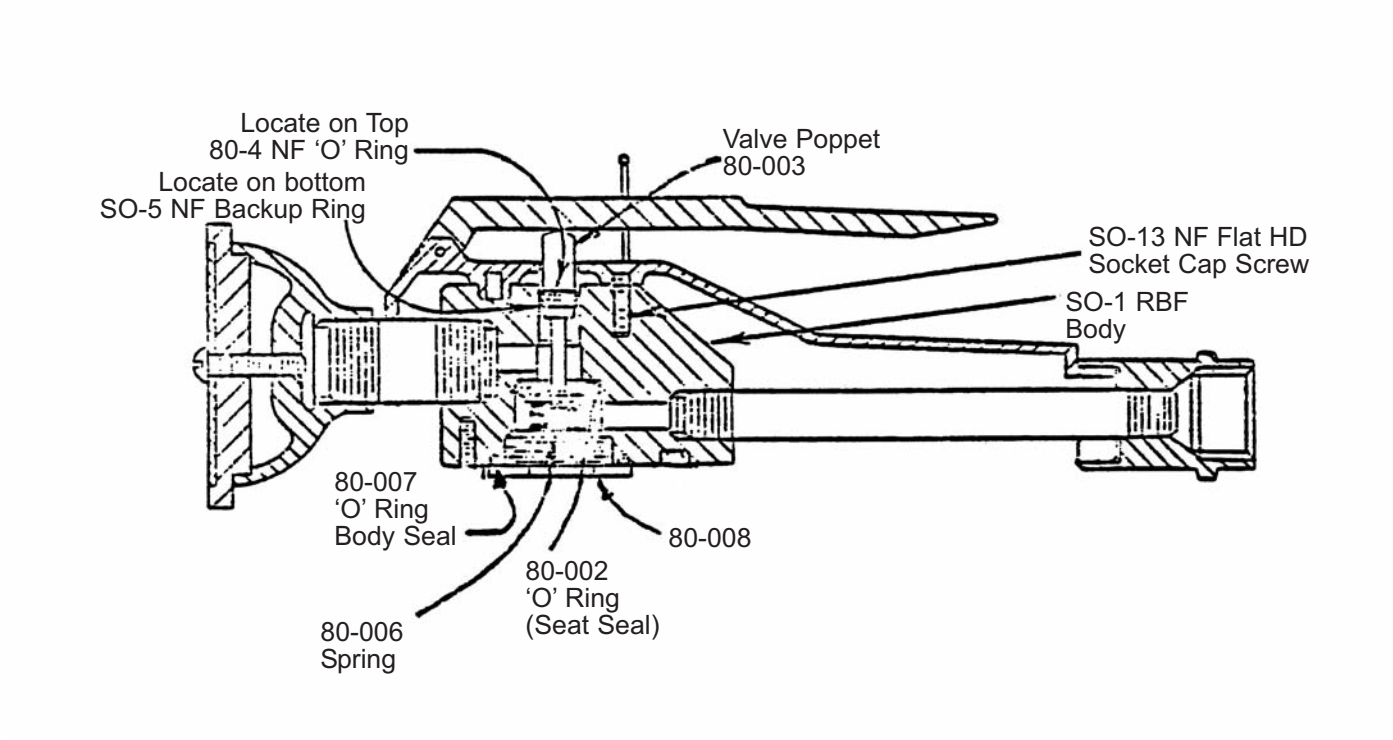
Remove 80-13 allen screw from bottom of housing with #6 allen wrench.



Slip lower housing <u>down</u> and pull forward with finger pressure only. This will clear the rear tongue in the adapter and allow ther front end of the housing to go past the sprayhead, when pulling forward.

The Chicago Faucet Co.
9/29/83 T-148

This procedure exposes the 80-008 retainer cap.

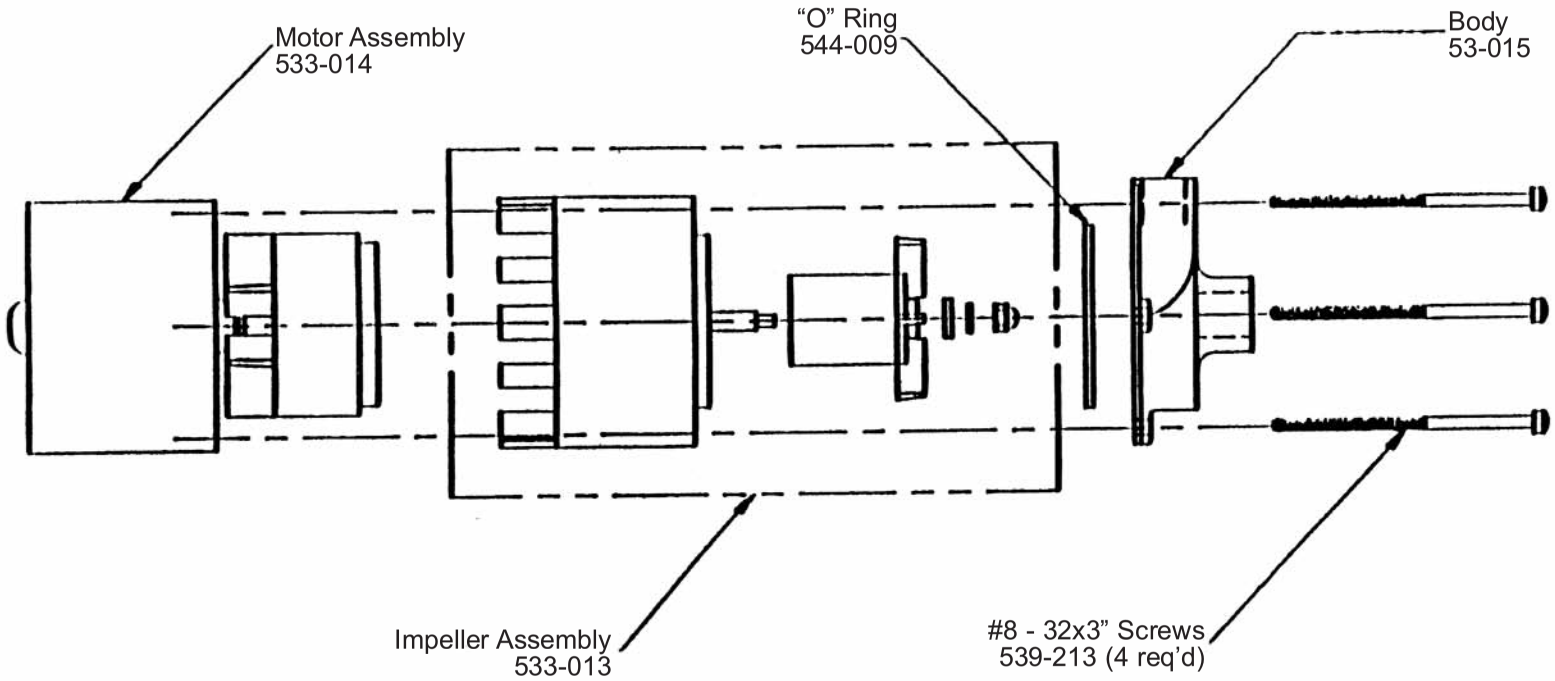


With a flat-faced wrench, remove the cap, turning counter-clockwise. Remove all parts as shown and replace with identical parts from repair kit #80-5K. Note that stem seal 80-004 is at the top and wiper 80-005 is at the bottom for proper seal wear on valve poppet.

After re-assembly tighten retainer cap against 80-007 body seal and test for proper function before completing re-assembly.

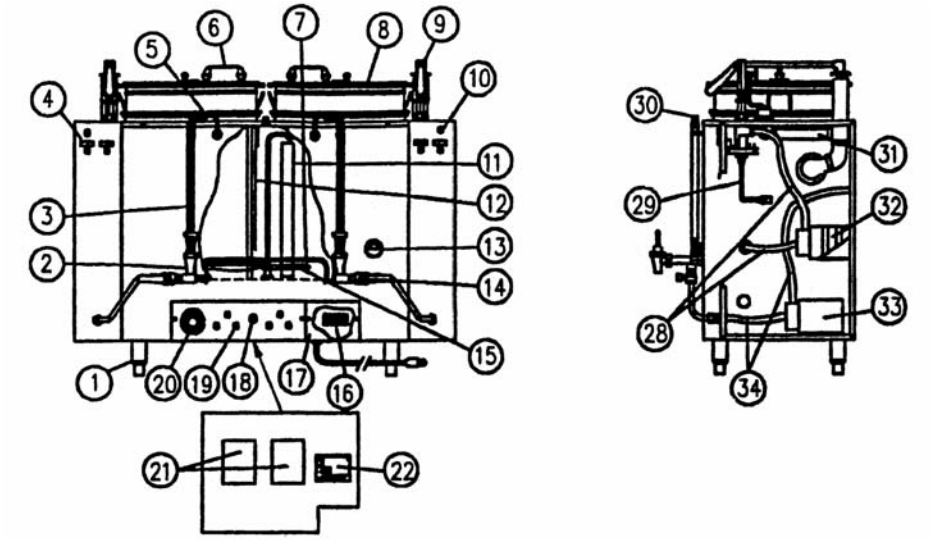
Replace lower housing, sliding rear tongue into adapter and positioning molded locator stud into hole in valve body, before inserting 80-013 screw. Tighten screw firmly. Do not overtighten as allen head socket will strip on the allen wrench making further service difficult.

The Chicago Faucet Co.
9/29/83 T-148

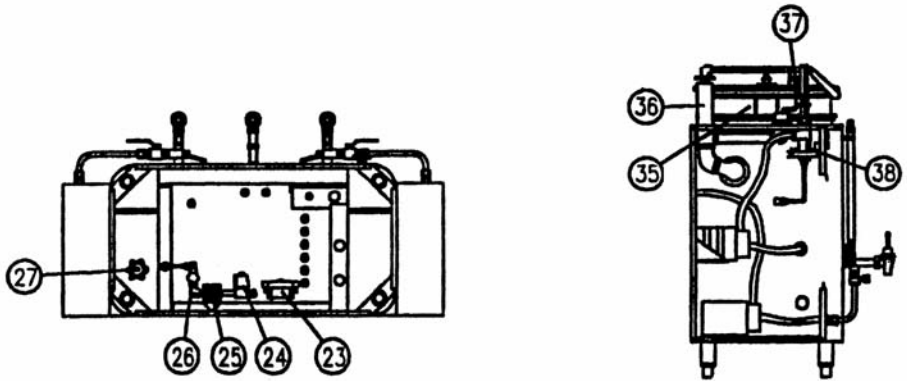


Complete Pump
Part # 533-012

REVISIONS			AMERICAN METAL WARE		
NO.	DATE	BY			
1			Hartell Sprayover Pump Parts Breakdown		
2					
3			DRAWN BY MKG	SCALE NONE	MATERIAL
4				DATE 9-3-87	DRAWING NO. 093-011
5					



Control Panel Top View



Bottom View

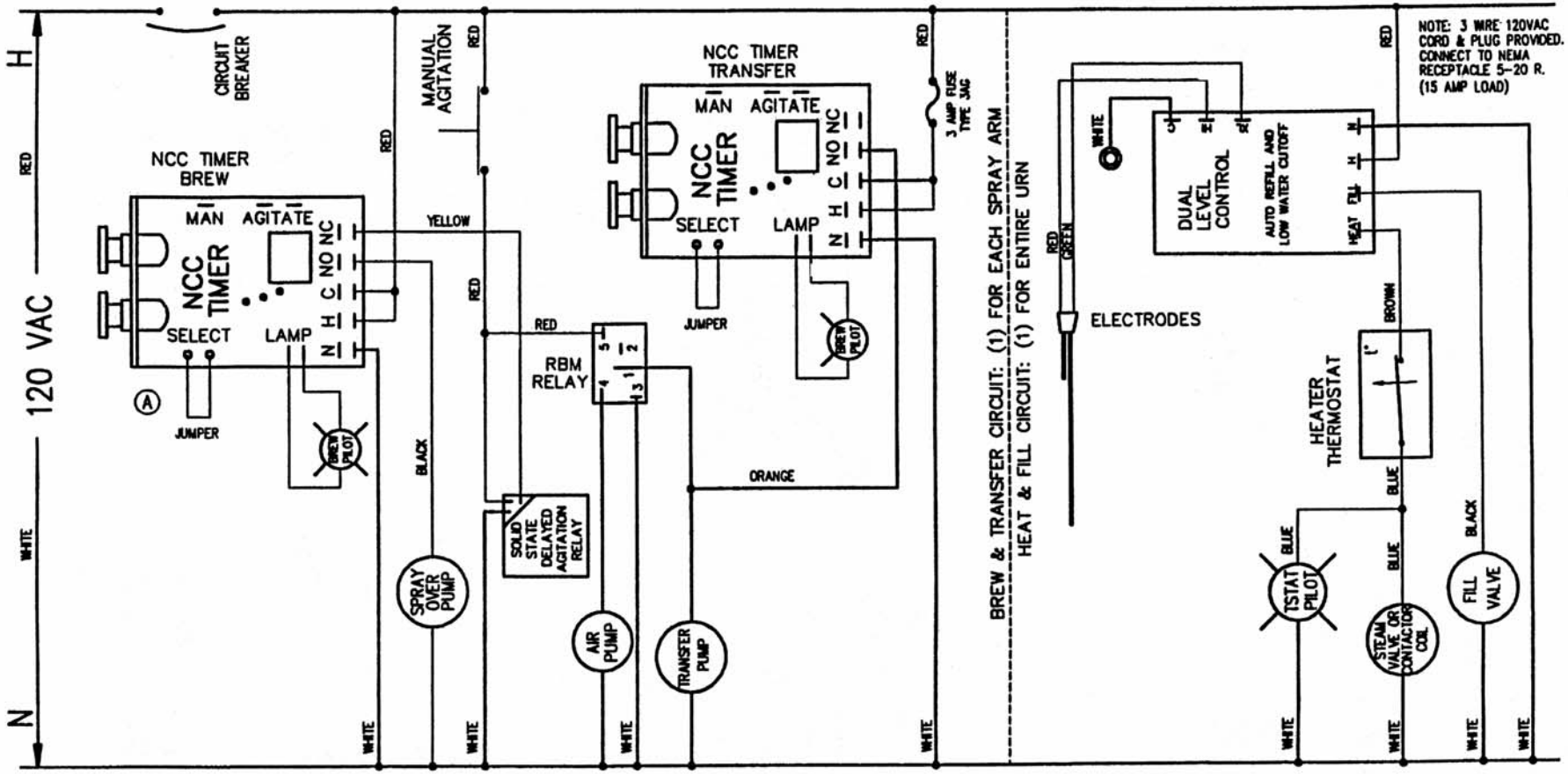
1. ADJUSTABLE LEG
2. FAUCET
3. GAUGE GLASS ASSEMBLY
4. TRANSFER TIMER
5. AIR AGITATION TUBING
6. COVER HANDLE
7. ELECTRIC IMMERSION HEATING ELEMENT(S) (ELECTRIC HEAT ONLY)
8. COFFEE LINER COVER
9. SPRAY ARM ASSEMBLY
10. 3 AMP FUSE
11. REFILL WATER INLET STANDPIPE
12. ELECTRODE ASSEMBLY
13. THERMOMETER
14. TRANSFER BALL VALVE
15. THERMOSTAT CAPILLARY BULB
16. POWER INPUT TERMINAL BLOCK (ELECTRIC HEAT ONLY)
17. TERMINAL BLOCK COVER
18. CONTROL SECTION CIRCUIT BREAKER
19. BREW TIMER
20. THERMOSTAT W/PILOT LIGHT
21. DUAL OUTPUT AIR PUMP
22. LIQUID LEVEL CONTROL
23. HEATER CONTACTOR (ELECTRIC HEAT ONLY)
24. WATER INLET FILL SOLENOID VALVE
25. WATER REGULATOR
26. INLET WATER-STRAINER
27. DRAIN
28. SPRAYOVER PUMP SILICONE TUBING
29. SPRAYOVER VALVE-DRAIN TUBING
30. TOP GAUGE CLEANOUT FITTING FOR AIR AGITATION
31. DRIP CUP AND VENT TUBE DRAIN ASSEMBLY
32. SPRAYOVER PUMP
33. TRANSFER PUMP
34. TRANSFER PUMP SILICONE TUBING
35. BREW BASKET
36. VENT TUBE
37. BYPASS VALVE
38. SPRAYOVER VALVE

REVISIONS			AMERICAN METAL WARE		
NO.	DATE	BY			
1			ILLUSTRATED PARTS BREAKDOWN LIST FOR 81110 AMV BREW URN		
2					
3			DRAWN BY WK	SCALE	MATERIAL
4			CHK'D	DATE 4-22-93	DRAWING NO. 090-914
5			TRACES	APPS	

High Volume Coffee Brewing/Holding System
Parts List - Electric and Steam Heat

Important: Give serial no. and model no. when ordering parts

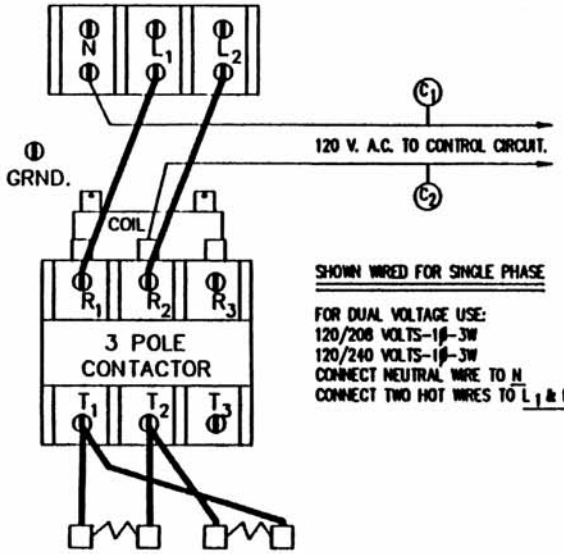
522005	10 Gal. Coffee Gauge Shield, 15”
522046	10 Gal. Water Gauge Shield, 14”
522035	10 Gal. Coffee Gauge Glass 5/8” x 15”
522048	10 Gal. Water Gauge Glass 5/8” x 14”
522030	Gauge Shield Bracket
522026	Upper Gauge Glass Rubber Washer
522027	Lower Gauge Glass Rubber Washer
A682	Gauge Shield Cap for Plug-In Cleanout Cap
A689	Plu-In Cleanout Cap w/O-rings for Air Agitation
A1132	Plug-In Cleanout Cap w/Vent Hole
521019	O-Ring for Cleanout Cap A689
522094	Coffee or Water Faucet
522102	Silicone Seat Cup for Faucet
542023	BB810WP Filter Paper 25 x 11
542012	10 Gal. Stainless Steel Bag Ring
542052	10 Gal. Muslin Cloth Filter 17 x 9
532064	Water Line Strainer 1/4”
506001	Thermometer
531011	Spray Nozzle
1214033	Spray Arm Handle
1214031	10 Gal. Spray Arm Assembly with Nozzle and Bypass
521014	O-Ring & Teflon Seal Kit for Spray Arm
508004	Air Pump (Agitation) (Dual)
508015	Air Pump (Agitation) (Single)
508030	Coffee Transfer Pump
533-012	Sprayover Pump Assembly w/Motor
	Renewal Parts for 508016:
533-013	Pump Seal Assembly
509003	Mushroom Knob w/Bolt for Cover
513001	Cover Handle Kit
509001	Cover Handle Spacer
509005	Spray Opening Cover Knob
712-017	Electrode Assembly
549-000	Liquid Level Control (Dual)
516007	120V, 3 wire, Cord & Plug for Brew Urn
515074	120V, 3 wire, Cord & Plug for Holding Urn
520001	Liner Washer, Silicone
530-007	Timer, Brew or Transfer
516001	RBM Control Relay
515001	Manual Coffee Agitation Switch
515016	5/16” Dia. Orange Pilot Light
515017	1/2” Dia. Red Pilot Light
515018	1/2” Dia. Amber Pilot Light, Opt. 47 Low Temp No Brew
515003	Fuseholder for Type 3AG Fuse
515053	3 Amp, Type 3AG Fuse
515065	On-Off Toggle Switch, DPST
504001	Thermostat, Heater Circuit
725-084	Thermostat, Opt. 47 - Low Temp No Brew Kit
537-060	Fill Solenoid Valve
537-061	Repair Kit for 505023 Solenoid Valve
537-062	Renewal Coil for 505023 Solenoid Valve
531-021	Solid State Relay (Agitation) NC
531-024	Solid State Relay, Opt. 43D NO
532097	Boiler Drain Valve
542006	SS Worm Gear Hose Clamp
512018	Pinch Clamp for 5/8” O.D. Silicone Tubing
151010	Coffee Liner Filter Screen
	Coffee Transfer SS Braided Teflon Lined Hose w/JIC Swivel Fittings - Specify Length
512012	Silicone Tubing 5/8” O.D. - Specify Length
	ALL MODELS ELECTRIC HEAT ONLY
515072	Circuit Breaker
	HEATING ELEMENTS:
535-045	5.7 KW 240 Volt
535-046	3.5 KW 240 Volt
535-047	6.6 KW 240 Volt
535-048	5 KW 240 Volt
535-049	4 KW 240 Volt
535-050	5 KW 480 Volt
535-051	4 KW 480 Volt
514009	Heater Contractor - 3 Pole
514005	Heater Contractor - 4 Pole
	ALL MODELS STEAM HEAT ONLY
506009	Steam Solenoid Valve 10-50 PSI
506014	Repair Kit for 506009
506016	Replacement Coil for 506009
532027A	Steam Strainer 1/2” FPT “Y” Type
	ALL MODELS - OPTION 121
712-051	Electrode Assm. 88040-60 Holding Urn
712-052	Electrode Assm. 88080-120 Holding Urn
- - - -	Flashing Signal Light
503060	490W, 120 Volt Contact Heater For Holding Urn
515075	Contact Thermostat For Holding Urn



REVISIONS			AMERICAN METAL WARE		
NO.	DATE	BY			
A	11-29-93 ECN #972	WK	WIRING DIAGRAM AMV BREW URN W/NCC TIMER, AUTO REFILL/LOW WATER CUTOFF, DELAYED AUTO AIR AGITATION, STEAM OR ELECTRIC HEAT		
B					
C			DRAWN BY WK	SCALE	MATERIAL
D			CHK'D	DATE 5-1-91	DRAWING NO. 091-359
E			TRACES	APPS	

SINGLE PHASE ONLY

CONNECT POWER HERE



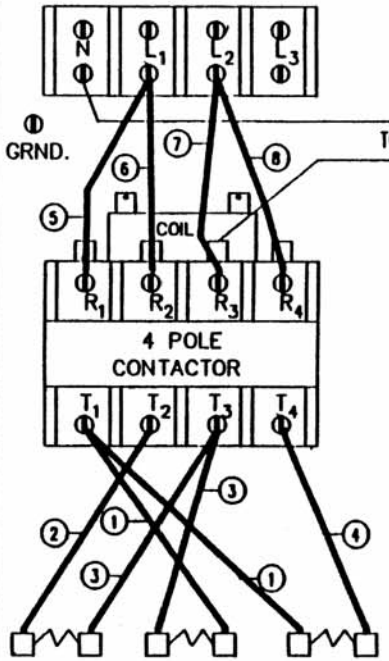
SHOWN WIRED FOR SINGLE PHASE

FOR DUAL VOLTAGE USE:
120/208 VOLTS–1ϕ–3W
120/240 VOLTS–1ϕ–3W
CONNECT NEUTRAL WIRE TO N
CONNECT TWO HOT WIRES TO L_1 & L_2

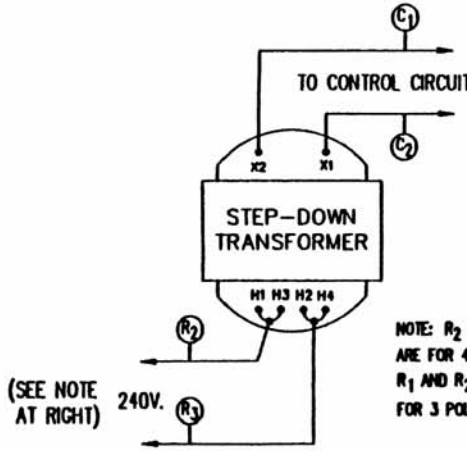
2 HEATING ELEMENTS – SINGLE PHASE ONLY
DO NOT WIRE 2 ELEMENTS 3 PHASE
NOTE: A 2 POLE CONTACTOR MAY BE USED ON MODELS HAVING A LOW WATTAGE HEATER

ELECTRIC SERVICE	STANDARD PARTS
120/208/3ϕ/4 WIRE 120/208/1ϕ/3 WIRE 120/240/1ϕ/3 WIRE	REQUIRES CIRCUIT BREAKER FOR CONTROL CIRCUIT PROTECTION. NEUTRAL TERMINAL BLOCK PROVIDED.
208/1ϕ/2 WIRE 240/1ϕ/2 WIRE 240/3ϕ/3 WIRE 208/3ϕ/3 WIRE	NO NEUTRAL TERMINAL BLOCK SUPPLIED. NON PUMP TYPE URNS INCLUDE STEPDOWN TRANSFORMER OR SEPARATE 120V CORD FOR CONTROL CIRCUIT. PUMP TYPE AND REMOTE DISPENSING URNS HAVE SEPARATE 120V CORD FOR CONTROL CIRCUIT.

CONNECT POWER HERE → SEE ELECTRICAL NAMEPLATE FOR PROPER VOLTAGE, PHASE AND NUMBER OF WIRES AND AMPERE LOAD.



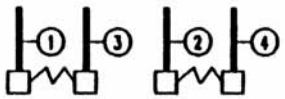
SINGLE PHASE WIRING SHOWN
TO CONVERT TO THREE PHASE Δ
1) MOVE WIRE ⑥ FROM L_1 TO L_3.
2) MOVE WIRE ④ FROM T_4 TO T_2.



NOTE: R_2 AND R_3 TERMINALS SHOWN ARE FOR 4 POLE CONTACTORS. R_1 AND R_2 TERMINALS ARE USED FOR 3 POLE CONTACTORS.

NEUTRAL TERMINAL BLOCK NOT SUPPLIED WITH TRANSFORMER

3 HEATING ELEMENTS



2 HEATING ELEMENTS – SINGLE PHASE ONLY
DO NOT WIRE 2 ELEMENTS 3 PHASE

REVISIONS NO.	DATE / ECN	BY
A		
B		
C		
D		
E		
F		

AMERICAN METAL WARE

STD., TOL.: .XXX±.005, .XX±.010, FRACTIONS±1/64, ANGLES±

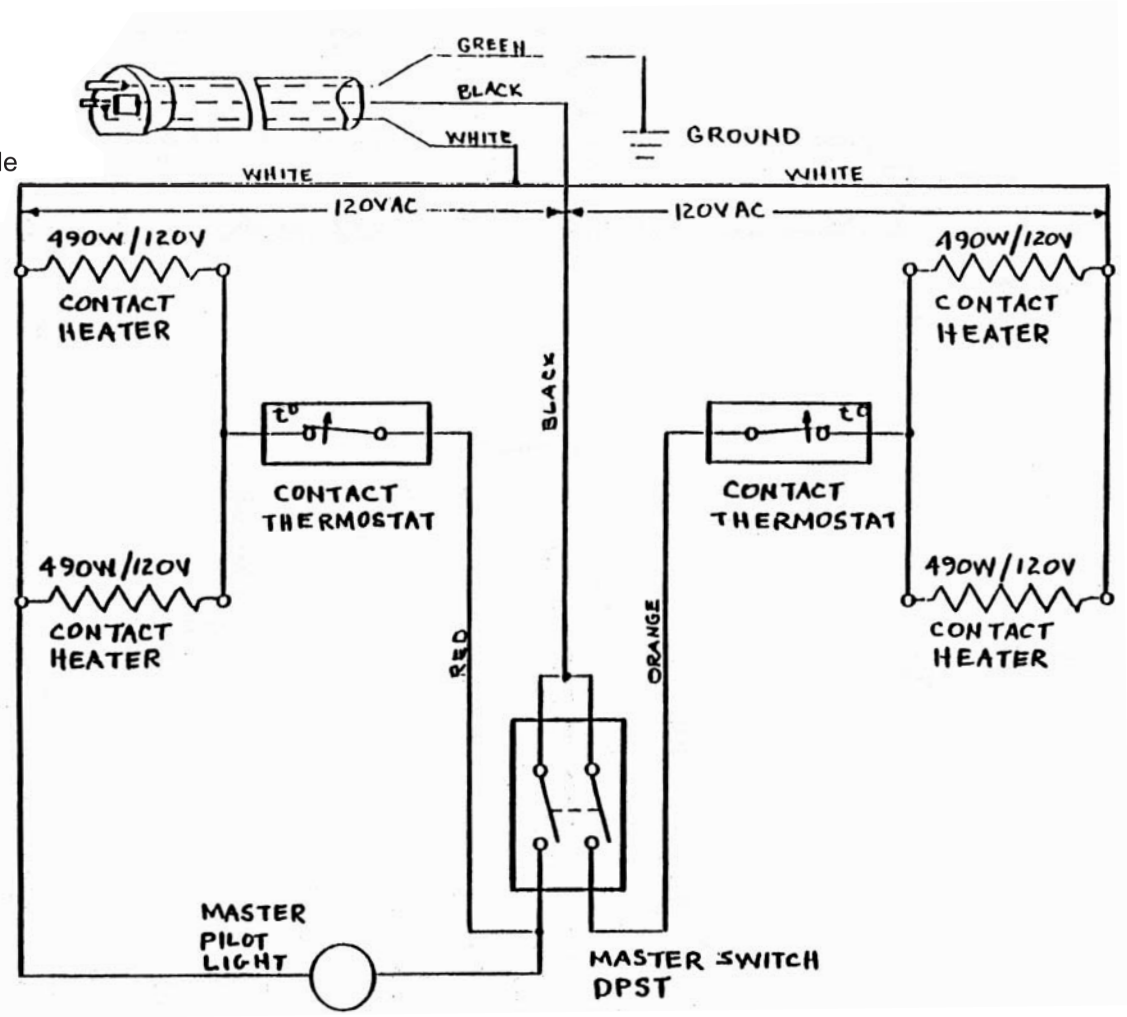
SCALE ____ MAT'L ____

DRAWN BY GP	CHK'D	APP'D
DATE 3-29-88	DATE	DATE

DTE TAB TERMINAL HEATER WIRING–208–240V URNS

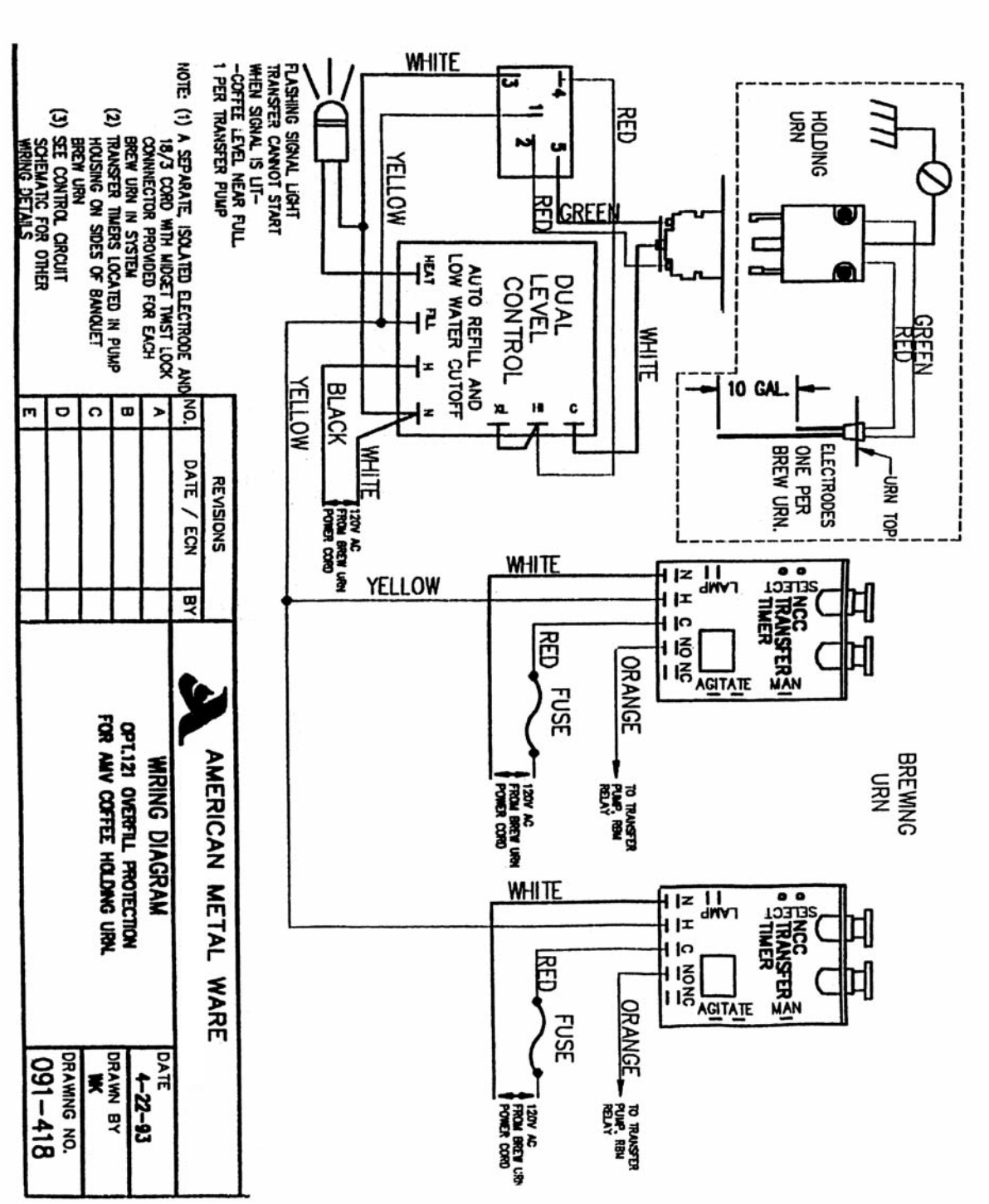
DRAWING NO. 091–227

Includes 6 foot long, 3 wire cord & plug. Connect to 120V AC, 20 amp circuit, Use NEMA receptacle No. 5-20R.



correct wire

REVISIONS			AMERICAN METAL WARE		
NO.	DATE	BY			
1			AMV HOLDING URN HEATER SCHEMATIC 2 KW, 120V, 1ϕ, 16.5 AMP LOAD		
2					
3			DRAWN BY LRO	SCALE 74	MATERIAL
4			CHK'D	DATE 12-23-80	DRAWING NO. A-1182
5			TRACES	APPS .	



GRINDMASTER™

CORPORATION

Grindmaster® Coffee Grinders and Brewers • Espressimo® Espresso Machines • Crathco® Hot Beverage Dispensers
Crathco® Cold and Frozen Beverage Dispensers • American Metal Ware® Coffee and Tea Systems
Tel (502) 425-4776 • Fax (502) 425-4664 • 1-800-695-4500
P.O. Box 35020 • Louisville, KY 40232 • USA
www.grindmaster.com • email: info@grindmaster.com